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Official Grain Grading Guide

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Official Grain Grading Guide — Revisions

August 1, 2005 to July 31, 2006

Date	IR#	Section	Remarks	Page
August 1, 2005	641	Moisture Testing	Revision of complete moisture section	All pages
August 1, 2005	636	Oats	Rewording of "Degree of Soundness" definition for CE Oats	7-21
August 1, 2005	641	Glossary	Revised definitions for "insect damage", "sprouted" and "wheat classes"	27-14, 27-26, 27-31
August 1, 2005	641	Standard abbreviations	Abbreviation added for "hard white spring"	26-4
August 1, 2005	641	Wheat	Changes as a result of Hard White Spring wheat being defined as a class of wheat by Regulation	4-2,4-3, 4-4, 4-21, 4-31, 4-34, 4-35, 4-65, 4-66
August 1, 2005	640	Wheat	Severely sprouted tolerances implemented for CWES. CPSW and CWSWS	4-41, 4-43, 4-45, 4-72, 4-74, 4-78
August 1, 2005	639	Wheat	Export tolerances for "broken grain" revised for all wheat classes	4-63, 4-67, 4-69, 4-71, 4-73, 4-75, 4-77
August 1, 2005	422	Flaxseed	Rewording and procedural change to "Damage" and "Heated" sections	11-7, 11-8, 11-9, 11-11
August 1, 2005	638	Standard Abbreviations	Numerous abbreviations added to coincide with ISA program	All pages

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1. Determining test weight

Test weight is the weight of a measured volume of grain expressed in kilograms per hectolitre.

Equipment needed to determine test weight

Ohaus 0.5 litre measure	A cylindrical shaped cup with an inside diameter of approximately 90 mm and a height of approximately 77.5 mm. The measure is calibrated to contain 500 ml of water, ± 1 mL, at 20°C.
Cox funnel	A funnel with a 3.81 cm opening and a drop of 4.41 cm, from the opening in the funnel to the top of the measure used to uniformly direct the flow of grain into the 0.5 litre cup..
Striker	A piece of round hardwood, 2.2 cm in diameter and approximately 23 cm in length.
Scale	Any CGC approved electronic metric scale.
Computer interface	For CGC inspection purposes, the electronic scale is connected to a computer which converts the grams in the 0.5 L Ohaus measure to grams per hectolitre. If the computer interface is not available, the test weight conversion can be done by utilizing charts provided by the CGC Statistical unit.
Test weight conversion charts	Used to convert the weight in grams from the Ohaus 0.5 L measure to kg/hL.

Procedure:

1. Fill the Ohaus measure to overflowing with the grain to be tested.
2. Ensure the slide is inserted into the Cox funnel.
3. Pour the contents of the 0.5 litre measure, plus an extra handful, into the Cox funnel.
4. Place the 0.5 litre measure on a solid base.
5. Position the Cox funnel on top of the 0.5 litre measure so that the notched legs of the Cox funnel fit securely onto the measure's rim.
6. Remove the slide on the Cox funnel quickly so that the grain drops evenly into the 0.5 litre measure.
7. Carefully remove the Cox funnel from the top of the 0.5 litre measure so as not to disturb the grain.

   ▲ **Important:** Any jarring of the cup at this point will result in compaction of the grain in the 0.5 litre measure and could produce inaccurate results.

8. Place the hardwood striker on the rim of the 0.5 litre measure and, using three zigzag, equal motions, scalp off the excess the grain in the measure.
9. Pour the grain remaining in the 0.5 litre measure into the scale pan.
10. Determine the weight in grams of the grain in the scale pan.
11. Convert the grams in the 0.5 litre measure to kg/hl.

Note: The CGC conversion formula takes into account the compaction factor of the various grains and is incorporated into the ISA computer software and the conversion charts. Doubling the weight of the grain in the 0.5 litre measure and dividing by ten (10) will not accurately predict the kg/hl.

Test weight, except for corn, is determined after the removal of dockage as defined in the cleaning procedures described for each class of grain.

Test weight on corn is determined prior to removal of cracked corn and foreigh material. At country elevators in eastern Canada, test weight is determined after the removal of dockage.

Note: Samples are graded *Sample Account Light Weight* only if the test weight is lower than the minimum established for that class of grain and in accordance with the Order of Precedence as stated in the *Glossary* section of the Official Grain Grading Guide.

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Introduction to moisture testing

Moisture testing means analyzing a grain sample for the percentage of moisture contained within it.

Moisture content can affect the test weight and the appearance of the grain. Grain that is too moist is susceptible to deterioration.

Moisture tests are performed on samples free of dockage.

Industry Services will determine the moisture content of grain using either NIT, a Model 1200A moisture meter or Model 919/3.5 moisture meter. Specific Work Instructions for moisture testing are available to CGC staff at \\WPG9\NETSOFT\Isqms\03 - Work Instructions\National. Copies of the Work Instructions are available from the CGC.

Moisture Specifications

The chart on the next two pages outlines the moisture specifications and conversion tables for each type of grain and lists the representative portion required to determine the moisture content of the sample.

Conversion tables are not available for all grains.

- For wheat, oats and barley samples with low test weight, see *Estimating moisture content for lightweight wheat, oats and barley samples* on page 2-5.
- For samples with moisture values above the range of the conversion table, see *Estimating moisture content for high moisture samples* on page 2-7
- For beans for which there are no conversion charts, see *Estimating moisture content for beans with no conversion table* on page 2-8.
- For other grains, see *Determining moisture content for special cases* on page 2-9.

Conversion tables for use with the Model 919/3.5" moisture meter

Grain	Weight (g)	Conversion table number	Tough (%)	Damp (%)
Wheat				
CWRS	250	10 (66 kg/hl and over)	14.6-17.0	over 17.0
lightweight	225	9 (less than 66 kg/hl)	14.6-17.0	over 17.0
CWHWS	250	1	14.6-17.0	over 17.0
CWES	250	2	14.6-17.0	over 17.0
CWSWS, CESWS	250	3	14.6-17.0	over 17.0
CWRW	250	5	14.6-17.0	over 17.0
CER	250	1	14.6-17.0	over 17.0
CERS	250	1 CERS	14.6-17.0	over 17.0
CEHRW	250	1 CEHRW	14.6-17.0	over 17.0
CESRW	250	1 CESRW	14.6-17.0	over 17.0
CWAD, CEAD	250	4	14.6-17.0	over 17.0
CPSR, CPSW	250	1	14.6-17.0	over 17.0
Oats	200	6	13.6-17.0	over 17.0
Oats lightweight	140	1 (less than 48 kg/hl - calibrate at 73)	13.6-17.0	over 17.0
Barley				
Select	225	13 (52 kg/hl or over)	13.6-17.0	over 17.0
General purpose	225	13 (52 kg/hl or over)	14.9-17.0	over 17.0
lightweight	200	10 (under 52 kg/hl)	14.9-17.0	over 17.0
Hulless	225	1	14.9-17.0	over 17.0
Rye	250	5	14.1-17.0	over 17.0

Conversion tables for use with the Model 91913.5" moisture meter (continued)

Grain	Weight (g)	Conversion table number	Tough (%)	Damp (%)
Flaxseed and solin	225	6	10.1–13.5	over 13.5
Canola and rapeseed	250	5	10.1–12.5	over 12.5
Mustard seed, all classes	250	8 - brown mustard 7 - oriental mustard 6 - yellow mustard	9.6–12.5	over 12.5
Peas, green and yellow	250	2	16.1–18.0	over 18.0
Split peas, green and yellow	250	1	16.1–18.0	over 18.0
Chick peas	250	1	14.1-16.0	over 16.0
Pea beans	250	2	no tough	over 18.0
Lentils	250	1	14.1-16.0	over 16.0
Peas, green and yellow	250	2	16.1–18.0	over 18.0
Beans				
Black	250	1	no tough	over 18.0
Cranberry	225	1	no tough	over 18.0
Faba	250	2	16.1–18.0	over 18.0
Dark red kidney	250	1	no tough	over 18.0
Pinto	250	1	no tough	over 18.0
Buckwheat	225	3	16.1-18.0	over 18.0
Triticale	250	1	14.1-17.0	over 17.0
Mixed grain	Use the conversion table and tough and damp ranges for the predominant grain.			

Grain	Weight (g)	Conversion table number	Tough (%)	Damp (%)	Moist (%)	Wet (%)
Corn	250	to 20.0—6				
	175	20.0–35.0—11A (used with 11B, Corn Test Weight Adjustment Table)	15.6– 17.5	17.6–21.0	21.1–25.0	over 25.0
Soybeans	225	8	14.1–16.0	16.1– 18.0	18.1–20.0	over 20.0
Sunflower seed	150	3 (calibrate at 73)	9.6–13.5	13.6– 17.0	17.1–22.0	over 22.0
Safflower seed	150	1 (calibrate at 73)	9.6–13.5	13.6–17.0	17.1–22.0	over 22.0

Estimating moisture content for lightweight wheat, oats and barley samples

Use these procedures for lightweight wheat, oats and barley samples.

- Canada Western Red Spring (CWRS) wheat is light weight if the test weight is less than 66 kg/hL or 320 g/0.5 L.
- Oats are lightweight if the test weight is less than 48 kg/hL or 220 g/0.5 L.
- Barley is lightweight if the test weight is less than 52 kg/hL or 250 g/0.5 L.
- Samples of wheat, oats and barley are also considered lightweight if grain touches the surface of the inverted cone portion of the cell post in the measuring cell.

Normal procedures for determining moisture content will give inaccurate results with light weight samples.

CWRS wheat, oats and barley

Conversion tables are available for lightweight Canadian Western Red Spring, oats and barley. See *Choosing a conversion table.*

Other wheats

These are the procedures for estimating the moisture content of lightweight samples of Canada Western Soft White Spring (CWSWS), Canada Western Hard White Spring (CWHWS), Canada Western Red Winter (CWRW), and Canada Western Amber Durum (CWAD), Canada Western Extra Strong (CWES), and Canada Prairie Spring Red or Canada Prairie Spring White (CPSR and CPSW) wheat.

1. Use a 225-g sample with the appropriate temperature.
2. Determine the moisture using Moisture Conversion Table No. 9 (Canada Western Red Spring wheat, test weight less than 66 kg/hL).
3. Subtract or add depending upon the correction factor for the appropriate class by moisture range according to the following table.

Correction factors

Moisture range (%)	CWSWS[1]	CWRW[2]	CWAD[3]	CWES[4]	CPSR/CPSW[5]	CWHWS[6]
10.0 - 12.0	+0.3	–0.1	–0.4	–0.2	0.2	-0.1
12.1 - 14.0	+0.1	–0.3	–0.6	–0.3	0.0	-0.1
14.1 - 16.0	0.0	–0.5	–0.8	–0.4	–0.3	-0.1
16.1 - 18.0	–0.1	–0.6	–0.9	–0.5	–0.5	-0.2
18.1 - 20.0	–0.2	–0.8	–1.1	–0.6	–0.7	-0.2

[1] Canada Western Soft White Spring

[2] Canada Western Red Winter

[3] Canada Western Amber Durum

[4] Canada Western Extra Strong

[5] Canada Prairie Spring Red/White

[6] Canada Western Hard White Spring

Example

Step	Example
1. Use a 225-g sample with the appropriate temperature.	1. A 225-g sample of light weight CWSWS wheat gives a meter reading of 40.0 at 15°C.
2. Determine the moisture using Moisture Conversion Table No. 9 (Canada Western Red Spring wheat, weight less than 66 kg/hL).	2. Conversion Chart No. 9 (CWRS wheat, test weight less than 66 kglhL) gives a percentage moisture of 16.2.
3. Add or subtract the correction factor from the chart for the appropriate class . according to the moisture range.	3. The correction factor from the Correction factors table is -0.1. The corrected moisture for the light weight sample is (16.2 - 0.1) or 16.1%

Estimating the moisture content of high moisture samples

If the moisture meter dial reading on a sample is higher than those on the moisture conversion table, use the following procedure to estimate moisture content.

1. Accurately, to two decimal places, weigh a sample larger than the quantity required for testing according to the appropriate sample weight on pages 2-6 and 2-7.

   For example, for CWRS, use 300 g, not 250 g.

2. Spread the sample on paper and let it dry at room temperature.
3. Reweigh the sample.
4. Calculate the percentage weight loss.

   A = original sample weight
   B = sample weight after air drying
   C = percentage loss in weight during drying

   $$\frac{(A-B)}{A} \times 100 = C$$

   Percentage loss in weight during air drying = 100

5. Mix the sample thoroughly.
6. Weigh out the amount required for a meter test.
7. Determine the temperature of the sample.
8. Follow the procedures on page 2-4 to determine the moisture content. (=D)
9. Determine the total moisture content of the sample using the following formula.

   C = percentage by weight of moisture loss on air drying (step 4)
   D = Moisture content determined by meter (step 8)

   $$\textit{Percentage moisture by weight} = \left[(100 - c) \times \frac{D}{100}\right] + C$$

10. Report the result to the nearest 0.1 %.

Estimating moisture content for beans with no conversion tables

For beans, the damp moisture range is over 18%.

Adzuki beans

1. Using a Boerner-type divider, divide a 250-g representative portion.
2. Determine moisture content using Cranberry Bean Conversion Table No. 1.
3. Subtract 2.5 from the table result.

Dutch brown beans

1. Determine sample size and moisture content from Pea Bean Conversion Table No. 2.
2. Subtract 1.1 from the table result.

White kidney beans

Use the Dark Red Kidney Bean Conversion Table No. 1 to determine the size of the representative portion and the moisture content.

Great northern white beans

1. Determine sample size and moisture content from Pea Bean Conversion Table No. 2.
2. Subtract 1.4 from the table result.

Kintoki beans

Use Dark Red Kidney Bean Conversion Table No. 1 to determine the size of the representative portion and the moisture content.

Light red kidney beans

Use the Dark Red Kidney Bean Conversion Table No. 1 to determine the size of the representative portion and the moisture content.

Otebo beans

1. Determine sample size and moisture content from Pea Bean Conversion Table No. 2.
2. Subtract 0.3 from the table result.

Pink beans

1. Determine sample size and moisture content from Pea Bean Conversion Table No. 2.
2. Subtract 1.1 from the table result.

Small red beans

1. Divide a sample of 250 g.
2. Use the following regression formula, where

   T = sample temperature (°C):
   % moisture = 0.155 x meter reading + 8.03 + {0.1 x (22 - T)}

Example

The Pea Bean Conversion Table No. 2 shows a sample of 250 g is required.
A sample of great northern white beans shows a meter reading of 25 at 18°C. According to the table, the moisture content for pea beans at this reading is 13.6%.
To adjust this moisture content for great northern white beans, subtract 1.4.
The moisture content of the great northern white beans is 13.6-1.4, or 12.2.

Determining moisture content for special cases

Optional analysis

An optional analysis is the process of determining the weight and grade of grain which would otherwise be assessed as dockage. If a sufficient quantity of grain is available, a moisture test will be done on all grains assigned a grade as part of the optional analysis.

When the grain assigned a grade as part of the optional analysis is not large enough for official moisture testing, and most of the sample is tough, damp, moist or wet, the optional analysis portion is graded tough, damp, moist, or wet without reference to a specific moisture content.

Corn

See *Determination of dockage* for corn.

1. Remove foreign material and cracked corn.

If the moisture content is...	Use this sieve...
25.0% or less	No. 12 round-hole
25.1 % or more	No. 14 round-hole

2. Choose the appropriate sample size by weight.

If the moisture content is...	Use a sample size of...
under 20.0%	250 g
from 20.0% to 35.0%	175 g

3. Choose the conversion table.

If the moisture content is...	Use conversion table...
20.0% or less	6
from 20.1% to 35.0%	11A—to estimate moisture content based on the dielectric reading and the temperature of the corn 11B—to adjust the preliminary moisture value according to the test weight of the corn sample (Table 11B increases the accuracy of the moisture test.)

3. Specifications for sieves

This table lists the sieves to be used to assess dockage and grading factors.

Sieves for assessing dockage and grading factors

Type	Sieve name	Hole size (millimetres)	Manufacturer's designation (inches)
Round-hole	No. 4.5	1.79	4½/64
	No. 5	1.98	5/64
	No. 5.5	2.18	5½/64
	No. 6	2.38	6/64
	No. 6.5	2.58	6½/64
	No. 7	2.78	7/64
	No. 7.5	2.98	7½/64
	No. 8	3.18	8/64
	No. 8.5	3.37	8½/64
	No. 9	3.57	9/64
	No. 10	3.97	10/64
	No. 11	4.37	11/64
	No. 12	4.76	12/64
	No. 14	5.56	14/64
	No. 15	5.95	15/64
	No. 16	6.35	16/64
	No. 17	6.75	17/64
	No. 18	7.14	18/64
	No. 20	7.94	20/64
	No. 21	8.33	21/64
	No. 22	8.73	22/64
	No. 24	9.52	24/64

Sieves for assessing dockage and grading factors

Type	Sieve name	Hole size (millimetres)	Manufacturer's designation (inches)
Slotted	No. 4.5	1.79 x 12.70	4½/64 x 1/2
	No. 5	1.98 x 19.05	5/64 x 3/4
	No. 6	2.38 x 19.05	6/64 x 3/4
	No. 8	3.18 x 19.05	8/64 x 3/4
	No. 9	3.57 x 19.05	9/64 x 3/4
	No. 11	4.37 x 19.05	11/64 x 3/4
	No. 12	4.76 x 19.05	3/16 x 3/4
	No. 3	1.19 x 7.94	3/64 x 5/16
	No. .064	1.60 x 9.53	0.064 x 3/8
	No. .028	0.71 x 11.90	0.028 x 15/32
	No. .032	0.81 x 11.90	0.032 x 15/32
	No. .035	0.89 x 11.90	0.035 x 15/32
	No. .038	0.96 x 11.90	0.038 x 15/32
	No. .040	1.02 x 11.90	0.040 x 15/32
Buckwheat	No. 5	triangle with 1.98 mm inscribed circle	triangle with 0.078 inscribed circle
	No. 6	triangle with 2.26-mm inscribed circle	triangle with 0.089-inch inscribed circle
Wire	No. 3 x 16	3 x 16 mesh per 25.4 mm	3 x 16 wire mesh per inch
	No. 4 x 14	4 x 14 mesh per 25.4 mm	4 x 14 wire mesh per inch
	No. 10 x 10	10 x 10 mesh per 25.4 mm	10 x 10 wire mesh per inch
	No. 9 x 9	9 x 9 mesh per 25.4 mm	9 x 9 wire mesh per inch

4. Wheat

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Classes and varieties

Class name	Grades	Variety (from the Regulations)
Canada Western Red Spring	No. 1 CWRS No. 2 CWRS No. 3 CWRS No. 4 CWRS	Any variety of the class CWRS designated as such by order of the Commission
Canada Western Hard White Spring	No. 1 CWHWS No. 2 CWHWS No. 3 CWHWS No. 4 CWHWS	Any variety of the class CWHWS designated as such by order of the Commission
Canada Western Amber Durum	No. 1 CWAD No. 2 CWAD No. 3 CWAD No. 4 CWAD	Any variety of the class CWAD designated as such by order of the Commission
	No. 5 CWAD	Any variety of amber durum wheat
Canada Western Red Winter	No. 1 CWRW No. 2 CWRW	Any variety of the class CWRW designated as such by order of the Commission
Canada Western Soft White Spring	No. 1 CWSWS No. 2 CWSWS No. 3 CWSWS	Any variety of the class CWSWS designated as such by order of the Commission
Canada Western Extra Strong	No. 1 CWES No. 2 CWES	Any variety of the class CWES designated as such by order of the Commission
Canada Prairie Spring White	No. 1 CPSW No. 2 CPSW	Any variety of the class CPSW designated as such by order of the Commission
Canada Prairie Spring Red	No. 1 CPSR No. 1 CPSR	Any variety of the class CPSR designated as such by order of the Commission
Canada Western Feed	CW Feed	Any type or variety of wheat excluding amber durum

Class name	**Grades**	**Variety (from the Regulations)**
Canada Eastern Red	No. 1 CER No. 2 CER No. 3 CER	Any registered variety of red wheat
Canada Eastern Red Spring	No. 1 CERS No. 2 CERS No. 3 CERS	Any variety of the class CERS designated as such by order of the Commission
Canada Eastern Hard Red Winter	No. 1 CEHRW No. 2 CEHRW No. 3 CEHRW	Any variety of the class CEHRW designated as such by order of the Commission
Canada Eastern Soft Red Winter	No. 1 CESRW No. 2 CESRW No. 3 CESRW	Any variety of the class CESRW designated as such by order of the Commission
Canada Eastern Amber Durum	No. 1 CEAD No. 2 CEAD No. 3 CEAD	Any variety of the class CEAD designated as such by order of the Commission
	CE Feed Durum	Any variety of amber durum wheat
Canada Eastern White Winter	No. 1 CEWW No. 2 CEWW No. 3 CEWW	Any variety of the class CEWW designated as such by order of the Commission
Canada Eastern Soft White Spring	No. 1 CESWS No. 2 CESWS No. 3 CESWS	Any variety of the class CESWS designated as such by order of the Commission
Canada Eastern Feed	CE Feed	Any type or variety of wheat excluding amber durum

Determination of commercially clean

Dockage is not assessed on wheat samples that meet the commercially clean specifications defined in the wheat export grade determinant tables. All samples must be analyzed to determine if they meet commercial cleanliness standards prior to dockage assessment. The analysis of samples which are **clearly** not commercially clean may consist of a visual assessment. For example, if there is no doubt that a sample contains more than 0.05% of small seeds without hand sieving and weighing the seeds then dockage will be assessed using procedures defined under *Determination of dockage.* Where there is any doubt regarding whether the sample is commercially clean, the sample must be analyzed using the procedures outlined below in steps 1 through 13 to confirm that the sample is not commercially clean prior to assessing dockage.

1. Using a Boerner-type divider, divide the sample to obtain a representative portion.
    - Official samples should be at least 900 g.
    - Unofficial samples should be at least 750 g.
2. Place approximately 250 grams of the sample at a time on the No. 5 buckwheat sieve nested over the No. 4.5 round-hole sieve.
3. Move the sieves from left to right 30 times using a sifting motion. One complete motion is approximately 10 cm from the center to one side, back to the center, approximately 10 cm to the other side and back to the center.
4. All broken wheat passing through the No. 5 buckwheat hand sieve or the No. 4.5 round hole sieve is weighed and the percentage calculated to determine if it meets the commercially clean specification of the grade for broken through a No. 5 buckwheat sieve. (Column #1 in the wheat export grade determinant tables)

    Note: Broken specifications differ for samples representing wheat ex primary, terminal and transfer elevators.
5. Small seeds passing the No. 4.5 round hole sieve are weighed and the percentage calculated to determine if they meet the commercially clean specification of the grade for small seeds. (Column #2 in the wheat export grade determinant tables)
6. Material other than broken grain and small seeds passing through the 4.5 round hole sieve is weighed and the percentage calculated to determine if it meets the commercially clean specification of the grade for attrition. (Column #3 in the wheat export grade determinant tables)
7. The sample portions remaining on top of the No. 5 buckwheat sieve and the 4.5 round hole sieve are recombined and divided using a Boerner-type divider to a representative portion of not less than 250 grams.
8. The portion divided from step 7 is handpicked to remove large seeds (as defined in the *Glossary),* roughage and wild oats.
9. The roughage material is weighed and the percentage calculated to determine if it meets the commercially clean specification of the grade for roughage. (Column #4 in the wheat export grade determinant tables)

10. The percentages of small seeds, attrition and roughage are added together to determine if the total meets the commercially clean specification of the grade for total small seeds, attrition and roughage. (Column #5 in the wheat export grade determinant tables)
11. The large seeds are weighed and the percentage calculated to determine if they meet the commercially clean specification of the grade for large seeds. (Column #6 in the wheat export grade determinant tables)
12. The wild oats are weighed and the percentage concentration calculated to determine if they meet the commercially clean specification of the grade for wild oats. (Column #7 in the wheat export grade determinant tables)
13. The percentages of small seeds, large seeds, and wild oats are added together to determine if the total meets the commercially clean specification of the grade for total small seeds, large seeds and wild oats. (Column #8 in the wheat export grade determinant tables)
14. The percentages of small seeds, large seeds, wild oats, roughage and broken grain through the No. 5 buckwheat sieve are added together to determine if the total meets the commercially clean specification of the grade for total small seeds, large seeds, wild oats, roughage and broken grain through the No. 5 buckwheat sieve (Column #9 in the wheat export grade determinant tables)

    Note: Specifications for total small seeds, large seeds, wild oats, roughage and broken grain through the No. 5 buckwheat do not apply to samples representing grain ex primary elevators

Should the percentage concentration of any of the factors determined in steps 1 through 14 exceed the specifications set out in columns #1 through #9 of the wheat export grade determinant tables the sample will be considered to be not commercial clean. Dockage will be assessed on samples determined to be not commercially clean using the procedures defined in *Determination of dockage.*

Note: Large seeds, small seeds, roughage and attrition are defined in the *Glossary.*

Export ready (ER)

Export ready refers to carlots which meet the following criteria:

1. The lot must meet the commercially clean specifications for the grade
2. Wheat of other classes and contrasting classes must meet the export specifications for the grade
3. Total foreign material must meet the export specification for the grade.

Carlots, which are commercially clean but do not meet the export specifications for either wheat of other classes or total foreign material, will be designated as "Not Ready for Export".

Not ready for export (NRE)

Not export ready refers to carlots which are commercially clean but do not meet the export specifications for either wheats of other classes, contrasting classes or foreign material

Determination of dockage

Definitions

Dockage is assessed to the nearest 0.1%.

Dockage is defined under the Canada Grain Act as "any material intermixed with a parcel of grain, other than kernels of grain of a standard of quality fixed by or under this Act for a grade of that grain, that must and can be separated from the parcel of grain before that grade can be assigned to the grain." Dockage is removed by following the cleaning procedures described in this chapter.

The sample as it arrives is referred to as the uncleaned or dirty sample. Its weight is the gross weight of the sample. Dockage is assessed on the gross weight of the sample.

Dockage is assessed in two stages.

1. Follow *Normal cleaning procedures,* using the Carter dockage tester.
2. Follow procedures for *Cleaning for grade improvement.* This cleaning can be done at any time after normal cleaning has been completed.

Dockage not reported

▲ **Important:** Dockage is not reported for samples grading

- Wheat, Sample CW/CE/CAN Account Fireburnt
- Wheat, Sample Salvage
- Wheat, Sample Condemned

For *Wheat, Sample CW/CE/CAN Account Admixture,* dockage is not reported for removable material similar in nature to the admixture.

Normal cleaning procedures

▲ **Important:** Wear gloves and a mask to handle any samples that you suspect may contain hazardous substances.

1. Set up the Carter dockage tester with the following specifications.

Feed control	#6
Air control	Minimum #4 (increase according to the nature of the material)
Riddle	No. 25
Top sieve	No. 6 buckwheat
Centre sieve	No. 5 buckwheat
Bottom sieve	No. 5 buckwheat
Sieve cleaner	Off

2. Using a Boerner-type divider, divide the uncleaned sample to obtain a representative portion.
   - Official samples should be at least 900 g.
   - Unofficial samples should be at least 750 g.
3. Turn on the Carter dockage tester.
4. Pour the sample into the hopper.
5. After the sample has passed through the machine, turn on the sieve cleaner control for 2 to 3 seconds to remove kernels lodged in the sieve.
6. Turn off the dockage tester.
7. Lightly snap the retainer rod of the aspiration pan to loosen material gathered on the air screen.
8. Remove the aspiration pan.
9. Handpick whole sound threshed kernels of wheat from the portion passing over the riddle and return them to the cleaned sample.

Composition of dockage

Dockage includes

- Wheat with long rootlets, unthreshed wheat heads, and material other than wheat removed by the No. 25 riddle
- Material removed by No. 5 buckwheat sieve in the lower position
- Material removed by aspiration
- A maximum of 10% of soft earth pellets handpicked from the clean sample.
- Material removed by *Cleaning for grade improvement*

Cleaning for grade improvement

If the grade of a sample can be improved by additional cleaning, perform the cleaning and add the additional material to dockage. Cleaning for grade improvement can be done at any time after normal cleaning.

The purpose of this cleaning is not to remove all foreign material, but rather to reduce the admixture of conspicuous separable material to within the grade tolerance.

1. After normal cleaning, examine the material to be removed and select your equipment according to that material. See the table, *Cleaning for grade improvement,* for the list of equipment.
2. Pass the sample through the Carter dockage tester, or sieve the sample by hand, depending on the material.

▲ **Important**: When you use a hand sieve, move the sieve from left to right 30 times, using a sifting motion. One time is one complete motion from the centre, to one side, to the other side, and back to the centre. The total distance from left to right is 20 cm, or about eight inches.

3. Weigh the additional dockage and add it to the original dockage

Cleaning for grade improvement-Wheat

Material to be removed	Equipment	Composition of dockage
Broken kernels	No. 6 buckwheat hand sieve No. 10x10 wire hand sieve	If the weight of broken kernels in the cleaned sample is over the grade tolerance, you can remove up to 5.0% of the gross weight in broken kernels to improve the grade. For example, if a sample of CWRS contains 12% broken kernels by gross weight, you can remove enough broken kernels to bring the percentage to 7%, which brings the sample within the grade tolerance for No. 3 CWRS. Add the maximum 5% broken kernels to dockage. See *Shrunken and broken.*
Bunt balls	Carter dockage tester, using the setup for *Normal cleaning procedures,* but with air control at a maximum setting of 7	If there is no odour, remove bunt balls and add to dockage. If there is an odour, bunt is a grading factor. See *Common bunt.*
Foreign material, such as cockle, oat groats, or rye grass	No. 6 buckwheat hand sieve No. 10x10 wire hand sieve	Add material to dockage, if the grade is improved as a result.
Stones	No. 6 buckwheat hand sieve	If the weight of stones and other material removed is • 5.0% or less of the gross weight, assess as dockage. • More than 5.0% of the gross weight, see *Stones* in Grading factors, or the relevant grade determinants table.
Wild oats	Carter dockage tester, using the setup for *Normal cleaning procedures,* but with No. 1 riddle No. 10x10 wire hand sieve	Everything removed is dockage.

Optional analysis

Where a shipper requests special cleaning of a carlot of grain at a terminal or elevator, and the elevator manager agrees, dockage material will be analyzed for the presence of grain. The percentage and grade of any grain contained in the dockage will be reported and elevator stocks will be adjusted on the basis of the analysis. Agreement of the shipper and unload elevator must be conveyed to the CGC in writing prior to the analysis being performed.

Procedures

1. Analyze the official sample.
2. Record the following on inspection records:
   - The percentage by gross weight to the nearest 0.1% and the grade of wheat.
   - The percentage by gross weight to the nearest 0.1% and the grade of grain separable from dockage.
   - The percentage of dockage.

   Example
   95.0% Wheat, No. 1 CWRS
   4. 0% Domestic Mustard Seed, No. 1 CAN Oriental
   1.0% dockage

Grading

Important definitions

Net weight of sample

The sample after cleaning and removal of dockage is referred to as the cleaned sample. Its weight is the net weight of the sample. Percentages by weight for grading refer to percentages of the cleaned sample, or the net weight.

Kernel counts (K)

A kernel count is the number of kernel-sized pieces in 500 gram sample.

- To do kernel counts, you must have 500 g of cleaned sample.
- All grading is done on representative portions divided down from the cleaned sample using a Boerner-type divider.

Hazardous substances in sample

Wear gloves and a mask to handle any samples that you suspect may contain hazardous substances. Hazardous substances are defined in the Regulations as "any pesticide, herbicide or dessicant".

Representative portion for grading

All grading is done on representative portions divided down from the cleaned sample, using a Boerner-type divider.

When the concentration of the grading factor is ...	**Then use ...**
Low	Optimum portion
High	Minimum portion or more **(do not use less)**

Values in the table on the next page represent a range of recommended portions of samples for grading.

Representative portion of wheat for grading, grams

Grading factor	Minimum	Optimum	Export
Artificial stain	250	500	500
Binburnt kernels	100	1000	1000
Blackpoint	25	50	50
Common bunt	50	100	100
Darkened kernels	100	500	500
Dark immature kernels	50	100	100
Degermed kernels	25	50	50
Ergot	500	1000	1000
Excreta	working sample	working sample	working sample
Fireburnt	500	working sample	working sample
Fusarium damage	10	100	100
Grasshopper, armyworm damage	50	100	100
Grass green kernels	50	100	100
Hard vitreous kernels, sieving	250	250	250
Hard vitreous kernels, handpick	15	25	25
Heated	25	250	500
Matter other than cereal grains	50	100	250
Mouldy	100	1000	1000
Natural stain	50	100	100
Odour	working sample	working sample	working sample
Other cereal grains	25	100	250
Other cereal grains and other matter	250	250	250
Penetrated smudge	100	500	500
Pink kernels	50	100	100
Red smudge	100	500	500
Rotted	100	1000	1000
Sawfly, midge damage	50	100	100
Sclerotinia	500	1000	1000
Severe midge damage	25	100	100
Severely mildewed	100	1000	1000
Severely sprouted	50	100	100
Shrunken and broken	250	250	250
Smudge	100	500	500
Soft earth pellets	working sample	working sample	working sample
Sprouted kernels	10	100	100
Stones	500	1000	1000
Superficial discolouration	working sample	working sample	working sample
Wheats of other classes or varieties	15 to 50	25 to 100	25 to 100

Grading factors

Artificial stain (ART STND)

▲ **Important**: Wear gloves and a mask to handle any samples that you suspect may contain hazardous substances.

Artificial stain

- Includes any nontoxic stain on kernels caused by contact with foreign substances such as dye, oil, grease, paint, or soot
- Does not include any stain considered a natural stain
- Does not include any stain caused by coming into contact with poisonous substances, or any stain that could be considered *Contaminated grain*

Representative portion for analysis

Minimum—250 g	Optimum—500 g	Export—500 g

Procedures

- If the amount of stain is not excessive, determine the kernel count.
- If the amount of stain seems excessive, determine the weight of stained kernels as a percentage of the net weight of the sample.

▲ **Important** If you are uncertain about the identity of the stain, treat the sample as *Contaminated grain.*

Binburnt kernels (BBT)

Binburnt kernels are blackened as a result of severe heating in storage. A cross of a binburnt kernel is smooth and glossy. A binburnt kernel is similar in weight to sound kernel.

There is a single tolerance for the total of binburnt, severely mildewed, mouldy, and rotted kernels.

Representative portion for analysis

Minimum—100 g	Optimum—1000 g	Export—1000 g

Procedures

- If the number of binburnt kernels is not excessive, determine the number of kernels in 1000 g.
- If the kernel count is excessive, determine the weight of binburnt as a percentage of the net weight of the sample.

Blackpoint (BLK PT)

Kernels with blackpoint have a distinct dark brown or black discolouration of the whole germ and surrounding area.

Representative portion for analysis

Minimum—25 g	Optimum—50 g	Export—50 g

Procedures

- Disregard a slight discolouration restricted to the germ.
- When the discolouration affects more than one-half of the kernel or extends into the crease, it is considered smudge.

In assessing blackpoint

- Depending on the severity of the discolouration and the overall quality of the sample, established tolerances may be exceeded at the inspector's discretion.

Broken (BKN)

Broken kernels are pieces of wheat that are less than three-quarters of a whole kernel. If the piece is more than three-quarters of a kernel, it is considered whole.
See *Shrunken and broken*

Common bunt (stinking smut) (SMUT)

Common bunt is a plant disease caused by fungi, characterized by

- Soft black bunt balls
- Kernels tagged with black bunt spores
- A distinct smutty odour, or the smell of rotten fish

Representative portion for analysis

Minimum—50 g	Optimum—100 g	Export—100 g

Procedures

See procedures for *Cleaning for grade improvement.*

- If samples have a distinct odour or are heavily infected with non-removable bunt balls, grade *Wheat Sample CW/CE/CAN Account Odour.*
- If kernels are tagged with bunt spores but there is no smutty odour, the sample is *Naturally stained* and graded accordingly.

Contaminated grain

▲ **Important:** Wear gloves and a mask to handle any sample that is suspected of containing contaminated grain.

Contaminated is defined in the *"Canada Grain Act"* as; "Contaminated means, in respect of grain, containing any substance in sufficient quantity that the grain is unfit for consumption by persons or animals or is adulterated within the meaning of the regulations made pursuant to sections B.01.046(1), B.15.001 and B.15.002(1) of the *Food and Drugs Act.*"
Samples deemed to be contaminated by the Grain Research Laboratory in consultation with the Chief Grain Inspector for Canada are graded *Wheat, Sample Condemned.*

Contrasting classes (CON CL)

See *Wheats of other classes or varieties (WOOC)*

Darkened kernels (amber durum)

Darkened kernels (amber durum) – Darkened kernels are similar in appearance to penetrated smudge with the exception that discolouration is gray to charcoal in colour rather than red to dark brown.

For grading purposes, darkened kernels should be considered as, and in conjunction with severe midge damage.

Representative portion for analysis

Minimum—100 g	Optimum—500 g	Export—500 g

Dark immature kernels (DKIM)

Dark immature kernels are also called swath-heated kernels. They are similar to heated kernels, but they do not exhibit the reddish discolouration associated with heated kernels, and they do not have a heated odour.

Representative portion for analysis

Minimum—50 g	Optimum—100 g	Export—100 g

Degermed kernels (DGM)

The germ has been removed through the mechanical handling process. Degermed kernels lack the greyish discolouration that is often present with sprouted kernels.

Representative portion for analysis

Minimum—25 g	Optimum—50 g	Export—50 g

Earth pellets (EP)

- Hard earth pellets are pellets that do not crumble under light pressure.
  See *Stones*.
- Soft earth pellets are pellets that crumble under light pressure.
  See *Soft earth pellets*.

Ergot (ERG)

Ergot is a plant disease which produces elongated fungus bodies with a purplish black exterior, a purplish white to off-white interior, and a relatively smooth surface texture.

Representative portion for analysis

Minimum—500 g	Optimum—1000 g	Export—1000 g

Procedures

- Determine the weight of ergot as a percentage of the net weight of the sample.

Excreta (EXCR)

▲ **Important:** Wear gloves and a mask to handle any samples that you suspect may contain `excreta.

Representative portion for analysis

Minimum—working sample	Optimum—working sample	Export—working sample

Fertilizer pellets (FERT PLTS)

Fertilizer pellets are typically either small, round and white or irregular shaped and pink or red. Fertilizer pellets are not considered a hazardous substance however there is no visible means of assuring that material resembling fertilizer pellets is not some other contaminant.

Representative portion for analysis

Minimum—working sample	Optimum—working sample	Export—working sample

Procedures

- Handpick any fertilizer pellets and determine the concentration basis the net working sample.
- Fertilizer pellets are assessed as stones when the concentration does not exceed 1.0% of the net sample weight.
- Samples containing fertilizer pellets in excess of 1.0% of the net sample weight are graded *Wheat, Held IP Suspect Contaminated Grain.*

Note: Canadian Grain Commission personnel should refer to ISO national work instruction "*Suspect Contaminated Grain, Handling Procedures*" for procedures to be followed when handling samples containing fertilizer pellets.

Fireburnt kernels (FBNT)

Fireburnt kernels are charred or scorched by fire. A cross-section of a fireburnt kernel resembles charcoal with numerous air holes which crumble easily under pressure.

Representative portion for analysis

Minimum—500 g	Optimum—working sample	Export—working sample

Foreign material (FM)

Foreign material is anything that is not wheat that remains in the sample after the removal of dockage.

Frost/Heat stress (FRHTS)

Frost/Heat Stress refers to wheat kernels with blistered brans as a result of exposure to freezing temperatures or prolonged hot weather conditions. The degree of blistering ranges from fine to coarse and is dependent upon the maturity of the grain, the temperature to which the grain is exposed and the duration of the exposure. Samples containing kernels affected by frost/heat stress are graded according to the degree of soundness definition as reflected in the standard or guide samples for each grade.

Fusarium damage (FUS DMG)

Fusarium-damaged wheat is typically characterized by thin or shrunken chalk-like kernels. Fusarium-damaged kernels have a white or pinkish fibrous growth which may be visible only under a magnifying lens.

Representative portion for analysis

Minimum—10 g Optimum—100 g Export—100 g

Procedures

1. Using a Boerner-type divider, divide the representative portion.
2. Separate all kernels showing any evidence of fusarium damage, including any kernels that have a chalk-like appearance.
3. You may examine kernels using a 10-power magnifying lens to confirm evidence of a white or pinkish mould or fibrous growth. In determining fusarium damage, use only kernels with this white or pinkish mould or growth.

Grass green kernels (GRASS GR)

Grass-green kernels are a distinct vivid green throughout because of immaturity.

Representative portion for analysis

Minimum—50 g Optimum—100 g Export—100 g

Grasshopper, army worm damage (GAW)

Kernels damaged by grasshopper or army worm are chewed, usually on the sides.

Representative portion for analysis

Minimum—25 g Optimum—100 g Export— 100 g

Hard vitreous kernels (HVK)

Vitreousness is the natural translucent colouring and is an indicator of kernel hardness. Hard vitreous kernels (HVK) are a grade determinant for the amber durum, red spring and red winter wheat classes.

Amber Durum

Hard vitreous kernels of amber durum include only those whole and broken kernels of amber durum that are reasonably sound and free of white starchy areas of any size. Kernels that are reasonably sound do not include sprouted, binburnt, severely mildewed, rotted, mouldy, heated, fireburnt, penetrated smudge, degermed, fusarium damaged, grass green, severely frost damaged, severe midge or kernels severely distorted from midge damage.

Kernels that are bleached are considered to be reasonably sound and may require cutting to determine if they contain starchy areas.

Red Spring and Red Winter

Kernels considered to be hard vitreous in samples of red winter and red spring wheat include only whole or broken kernels of red wheat classes that are reasonably sound and free of white starchy areas of any size. Kernels that are reasonably sound do not include sprouted, binburnt, severely mildewed, rotted, mouldy, heated, fireburnt, penetrated smudge, degermed, fusarium damaged, grass green, severely frost damaged or kernels severely distorted from midge damage.

Cutting is not permitted in determining vitreousness in bleached samples of red spring and red winter. Bleached kernels of red wheat classes in samples of red spring and red winter that do not have a clearly discernable starchy area are considered vitreous.

Representative portion for sieving

Minimum—250 g Optimum—250 g Export—250 g

Representative portion for handpicking

Minimum—15 g Optimum—25 g Export—25 g

Procedures

1. Using a Boerner-type divider, divide a representative portion of 250 g from the cleaned sample.
2. Sieve the representative portion mechanically, using the Carter dockage tester or manually using the No. 4.5 slotted sieve.

Feed control	#6
Air control	Off
Riddle	None
Top sieve	No. 4.5 slotted sieve
Centre sieve	Blank tray
Bottom sieve	None
Sieve cleaner	Off

Manual method

Sift the approximately 250 g clean sub-sample over the No. 4.5 slotted hand sieve. Sifting shall consist of 25 complete motions of about 15 cm total distance.

3. From the material that remains on top of the sieve or lodged in the sieve, divide a portion of 15 g, or 25 g for export shipments.

   Material that passes through the sieve is not used in the determination of HVK.
4. Separate vitreous and non-vitreous kernels from the 15-g portion.
5. For amber durum only: Cut and examine the endosperm of bleached kernels to determine if they are vitreous.

Heated kernels (HTD)

Heated kernels have the colour and may have the odour typical of grain that has deteriorated in storage or has been damaged by artificial drying. They range from orange-red to very dark brown, but are not black.

Representative portion for analysis

Minimum—25 g Optimum—250 g Export—500 g

Indian meal moth (DGM)

Consider kernels showing damage from Indian meal moth as degermed.
See *Degermed.*

Representative portion for analysis

Minimum—25 g Optimum—50 g Export—50 g

Matter other than cereal grains (MOTCG)

Matter other than cereal grains is

- Inseparable seeds such as ragweed, Tartary buckwheat, rye grass, and wild oats
- Non-cereal domestic grains such as flaxseed, corn, peas, buckwheat and lentils that remain in the cleaned sample

Representative portion for analysis

Minimum—50 g Optimum—100 g Export—250 g

Midge damage (MDGE DMG)

Midge-damaged kernels are distinctly shrunken or distorted. They are characterized by a depression or caved-in side marked by a scarred pericarp. The pericarp is frequently ruptured, exposing the endosperm.

Representative portion for analysis

Minimum—25 g Optimum—100 g Export—100 g

Mouldy kernels (MLDY KRNL)

Mouldy kernels are discoloured, swollen and soft as a result of decomposition by fungi or bacteria. They have mould visible to the naked eye and can feel spongy under pressure.

There is a single tolerance for the total of binburnt, severely mildewed, mouldy, and rotted kernels.

Representative portion for analysis

Minimum—100 g	Optimum—1000 g	Export—1000 g

Procedures

For CE wheat

- If the number of mouldy kernels is not excessive, determine the number of kernels in 1000 g.
- If the number of mouldy kernels is excessive, determine the weight of mouldy kernels as a percentage of the net weight of the sample.

For CW wheat

- Determine the weight of mouldy kernels as a percentage of the net weight of the sample
- If the number of mouldy kernels is not excessive, determine the number of kernels in 1000 g.

Natural stain (NSTN)

A natural stain is any stain on kernels caused by contact with natural substances such as bunt spores, soil or weeds.

Representative portion for analysis

Minimum—50 g	Optimum—100 g	Export—100 g

Odour (ODOR)

There is no numeric tolerance for odour. Consider

- The basic quality of the sample
- The type and degree of the odour—such as fuel oil, skunk or urea
- The presence of visible residue causing the odour

Representative portion for analysis

Minimum—working sample	Optimum—working sample	Export—working sample

If odour is the grade determinant and there is...	Then the grade is...
A distinct objectionable odour not associated with the quality of the grain, but not heated or fireburnt	*Wheat, Sample CW/CE/CAN Account Odour*
A distinct heated odour	*Wheat, Sample CW/CE/CAN Account Heated*
A distinct fireburnt odour	*Wheat, Sample CW/CE/CAN Account Fireburnt*

Other cereal grains (OCG)

Other cereal grains in wheat are rye, barley, triticale, oats, oat groats, and wild oat groats that remain in the cleaned sample. Other cereal grains are treated as total foreign material.

Representative portion for analysis

Minimum—25 g Optimum—100 g Export—250 g

Other cereal grains and other matter (OCGOM)

Other cereal grains and other matter in the export grade determinant tables refers to cereal grains other than wheat and to inseparable material excluding large seeds, wild oats, stones, mineral matter, ergot and *sclerotinia sclerotiorum.*

Representative portion for analysis

Minimum—250 g Optimum—250 g Export—250 g

Penetrated smudge (PENT SM)

With penetrated smudge, the discolouration penetrates and extends throughout the endosperm, usually as a result of a more severe infection.

Representative portion for analysis

Minimum—100 g Optimum—500 g Export—500 g

Procedures

- If the amount of smudge is not excessive, determine the kernel count.
- If the kernel count is excessive, determine the amount of smudge as a percentage of the net weight of the sample.

Pink kernels (PNK)

Pink pigment in wheat kernels is an indication of immaturity. Pink kernels

- Are shrunken
- Display a pink discolouration

▲ **Important:** Do not confuse pink kernels with fusarium-damaged kernels, pesticide treated seed or other contaminated grains.

Representative portion for analysis

Minimum—50 g Optimum—100 g Export—100 g

Protein (PROT)

The classes of CWRS, CWHWS, CWAD, CWES and CWRW wheat have a minimum protein level.

See *Primary grade determinants tables*.

Red smudge (RSM)

Red smudge is a dark reddish discolouration usually associated with amber durum wheat. It usually affects the entire bran portion of the kernel. Discolouration is not superficial and cannot be removed through abrasion.

Representative portion for analysis

Minimum—100 g	Optimum—500 g	Export—500 g

Procedures

- If the amount of smudge is not excessive, determine the kernel count.
- If the kernel count is excessive, determine the amount of smudge as a percentage of the net weight of the sample.

Rotted kernels (ROT KRNL)

Rotted kernels are discoloured, swollen and soft as a result of decomposition by fungi or bacteria. They feel spongy under pressure.

There is a single tolerance for the total of binburnt, severely mildewed, mouldy, and rotted kernels.

Representative portion for analysis

Minimum—100 g	Optimum—1000 g	Export—1000 g

Procedures

For CE wheat

- If the number of rotted kernels is not excessive, determine the number of kernels in 1000 g.
- If the number of rotted kernels is excessive, determine the weight of rotted kernels as a percentage of the net weight of the sample.

For CW wheat

- Determine the weight of rotted kernels as a percentage of the net weight of the sample.
- If the number of rotted kernels is not excessive, determine the number of kernels in 1000 g.

Ruptured kernels

Kernels are considered to be ruptured when the cheeks and/or backs of the kernels are split open.

Note: Ruptured kernels are considered as severely damaged for grading purposes and are assessed under the "Degree of Soundness" definition of the grading table.

Sawfly damage (SFLY DMG)

Kernels with sawfly damage are shrivelled or distorted.

Representative portion for analysis

Minimum—25 g	Optimum—100 g	Export—100 g

Sclerotinia sclerotiorum (SCL)

Sclerotinia sclerotiorum is a fungus producing hard masses of fungal tissue, called *sclerotia*. The sclerotia vary in size and shape, have a course surface texture, vary in exterior color from dark black to gray to white and have a pure white interior.

Representative portion for analysis

Minimum—500 g	Optimum—1000 g	Export—1000 g

Procedures

- Determine the weight of the *sclerotinia sclerotiorum* as a percentage of the net weight of the sample.

Severe midge damage (SEVMDGE)

Midge damaged kernels that are blackened by moulds are classed as severe midge damage. This discolouration is the result of a secondary fungal infection. Severe midge damage is determined for CWAD only.

Representative portion for analysis

Minimum—25 g	Optimum—100 g	Export—100 g

Severely mildewed kernels (SEVMIL)

In severely mildewed wheat, mildew spores have severely blackened the kernel inside and out. The kernels feel spongy under pressure.

There is a single tolerance for the total of binburnt, severely mildewed, mouldy, and rotted kernels.

Representative portion for analysis

Minimum—100 g	Optimum—1000 g	Export—1000 g

Procedures

For CE wheat

- If the number of severely mildewed kernels is not excessive, determine the number of kernels in 1000 g.
- If the kernel count is excessive, determine the weight of severely mildewed kernels as a percentage of the net weight of the sample.

For CW wheat

- Determine the weight of severely mildewed kernels as a percentage of the net weight of the sample.
- If the number of rotted kernels is not excessive, determine the number of kernels in 1000 g.

Severely sprouted kernels (SEVSPTD)

Kernels are assessed as severely sprouted when they

- Have sprouts extending beyond the normal contours of the germ
- Are severely degenerated as an apparent result of advanced sprouting

Representative portion for analysis

Minimum—50 g	Optimum—100 g	Export—100 g

Shrunken and broken (SHR, BKN)

Percentages of shrunken and broken kernels are determined from the same representative portion.

Shrunken kernels (SHR)

Shrunken kernels are whole kernels of wheat that pass through a No. 4.5 slotted sieve.

Broken kernels (BKN)

Broken kernels are pieces of wheat that are less than three-quarters of a whole kernel. If the piece is more than three-quarters of a kernel, it is considered whole.

Representative portion for analysis

Minimum—250 g	Optimum—250 g	Export—250 g

Determine the percentage of shrunken kernels

1. Using a Boerner-type divider, divide a representative portion of approximately 250 g from the sample.
2. Pass the portion through the Carter dockage tester set up as follows:

Feed control	#5
Air control	Off
Riddle	None
Top sieve	No. 4.5 slotted
Centre sieve	Blank tray
Bottom sieve	None
Sieve cleaner	Off

3. Handpick broken kernels which pass through the sieve.

Determine the percentage of broken kernels

4. Using a Boerner-type divider and the remaining portion from which the shrunken kernels have been removed, divide a representative portion of approximately 50 g.
5. Handpick broken kernels from the 50-g portion.
6. Add this percentage to the percentage of handpicked kernels from Step 3.
7. Determine the percentage by net weight of broken kernels.

Report total shrunken and broken (TSHRBKN)

8. When the percentage of shrunken, broken or total shrunken and broken is the grade determinant and is over the grade tolerance by up to 0.9% the excess fraction up to 0.9% is truncated for grade determination, for example, 4.6% is considered 4.0%. However, the percentages of shrunken, broken and total shrunken and broken recorded in documentation is the actual non-truncated percentages. The percentages of total shrunken and broken subject to truncation is the sum of the actual non-truncated percentages of shrunken kernels and of broken kernels.

Examples
1 CWRS tolerances: shrunken 4%; broken 5%; total shrunken and broken 7%

Example 1
A 1 CWRS with; shrunken 4.7%, broken 2.2%; total shrunken and broken 6.9%

Shrunken would be reported as 4.7% but would be considered to be 4% for grade determination, total shrunken and broken would be reported as 6.9%. The sample would grade 1 CWRS.

Example 2
A 1 CWRS with; shrunken 4.7%, broken 3.2%, total shrunken and broken 7.9%.

Shrunken would be reported as 4.7% but would be considered to be 4% for grade determination. Total shrunken and broken would be reported as 7.9% but would be considered to be 7% for grade determination. The sample would grade 1 CWRS.

Example 3
A 1CWRS with; shrunken 4.7%, broken 3.4% and total shrunken and broken 8.1%.

Total shrunken and broken would be reported as 8.1% and could not be truncated in the determination of grade because it exceeds the tolerance by more than 0.9%. Shrunken would be reported as 4.7% but would be considered to be 4% for grade determination since truncation would improve the grade from a CWFD to 2 CWRS. The sample would grade 2 CWRS for 8.1% Total Shrunken and Broken.

Smudge (SM)

Smudge is a discolouration on the kernel as a result of infection by some common field fungi. The discolouration may be brown, black or red.

Amber durum

The discolouration is assessed as smudge in amber durum if:

1. More than one-half the kernel is discoloured, or
2. Discolouration of the crease
   - Has spread onto the cheeks of the kernel regardless of any discolouration of the germ
   - Appears as a thin line extending more than half the length of the crease, in combination with any discolouration of the germ.

Note: kernels that have a thin line of discolouration of any length in the crease, but have no discolouration of the germ, are not assessed as smudge.

Classes of wheat other than amber durum

The discolouration is considered as smudge in wheat classes other than amber durum if more than one-half of the kernel is discoloured, or if the discolouration extends into the crease. Less extensive discolouration is considered blackpoint.

Representative portion for analysis

Minimum—100 g Optimum—500 g Export—500 g

Soft earth pellets (SEP)

Soft earth pellets are

- Earth pellets that crumble into fine dust under light pressure, using a finger only— if they do not crumble, they are considered *Stones.*
- Any non-toxic material of similar consistency.

Representative portion for analysis

Minimum—working sample Optimum—working sample Export—working sample

Procedures

1. Handpick soft earth pellets from the clean sample.
2. Soft earth pellets constituting 10% or less of the sample are assessed as dockage.
3. Where soft earth pellets represent more than 10% of the net weight, the sample is graded *Wheat, Sample Account Admixture.*

Sprouted kernels (SPTD)

Kernels are sprouted if one of the following conditions exists:

- Kernels show clear evidence of growth in the germ area.
- The bran is noticeably split over the germ from apparent growth.
- The germ is missing and there is apparent greyish discolouration normally attributable to sprouting.
- The germ, though intact, appears distinctly swollen as a result of sprouting activity.

Representative portion for analysis

Minimum—10 g Optimum—100 g Export— 100 g

Procedures

1. Using a Boerner-type divider, divide a representative portion.
2. Separate all kernels showing any evidence of sprouting.

▲ **Important:** For CEWW, unless there is clear evidence of growth, do not count the kernel as sprouted.

3. You may use a 10-power magnifying lens to confirm sprouting activity.

Stones (STNS)

Stones are hard shale, coal, hard earth pellets, and any other non-toxic materials of similar consistency. Fertilizer pellets are assessed as stones when constituting 1.0% or less of the net sample weight. (See *Fertilizer pellets* for specific procedures to be followed when samples contain fertilizer pellets.)

Representative portion for analysis

Minimum—500 g	Optimum—1000 g	Export—1000 g

Procedures

1. Handpick stones from a representative portion of the cleaned sample.
2. Determine stone concentration in the net sample.

Note: Stones may be removed and included in dockage if the material removed is 5% or less of the gross weight of the sample. See *Cleaning for grade improvement.*

- In western Canada samples of grain containing stones in excess of "basic grade" tolerances, up to 2.5% are graded *Wheat, Rejected "basic grade" Account Stones.* The "*basic grade*" refers to a grade established in the Canada Grain Regulations (grades listed in the first column in grade determinant tables) that would have been assigned to the sample if it contained no stones.
- In eastern Canada samples of grain containing stones in excess of grade tolerances are degraded to lower grades. Samples containing stones in excess of the tolerance of the lowest grade established by regulation up to 2.5% are graded *Wheat, Sample Canada Eastern/Can Account Stones.*
- In western and eastern Canada grain containing more than 2.5% stones is graded *Wheat, Sample Salvage.*

Examples: Western Canada

Excerpt from grade determinant tables for
Wheat, Canada Western Red Spring

Grade name	Stones %
No. 1 CWRS	0.03
No. 2 CWRS	0.03
No. 3 CWRS	0.06
No. 4 CWRS	0.06
CW Feed	0.10

Basic grade:......................... *Wheat, No. 3 CWRS*

Reason for basic grade:....... Mildew

If the above sample contained	Grade in Western Canada
0.08% stones	*Wheat, Rejected No. 3 CWRS Account Stones*
1.0% stones	*Wheat, Rejected No. 3 CWRS Account Stones*
3.0% stones	*Wheat, Sample Salvage*

Examples: Eastern Canada

Excerpt from grade determinant tables for
Wheat, Canada Eastern Red Spring

Grade name	Stones %
No. 1 CERS	0.03
No. 2 CERS	0.03
No. 3 CERS	0.06
CE Feed	0.10

Basic grade:......................... *Wheat, No. 3 CERS*

Reason for basic grade:....... Mildew

If the above sample contained	Grade in Eastern Canada
0.08% stones	*Wheat, CE Feed*
1.0% stones	*Wheat, Sample CE Account Stones*
3.0% stones	*Wheat, Sample Salvage*

Streak mould

Kernels with unusual dark grey streaks on their sides toward the brush may indicate streak mould. This very slow-growing mould is harmless in wheat, but it affects kernel appearance. It occurs most commonly in red winter wheat. It is not related to the more serious storage moulds.

Representative portion for analysis

Minimum—25 g
Optimum—50 g
Export—50 g

Procedures

For grading, include streak mould with blackpoint.

Superficial discolouration (SUPDISCLR)

Superficial discolouration is a reddish discolouration not penetrating the endosperm. This factor is evaluated subjectively in relation to the degree of soundness without reference to specific tolerances.

Representative portion for analysis

Minimum—working sample
Optimum—working sample
Export—working sample

Treated seed and other chemical substances

Treated seed

Treated seed is grain that has been coated with an agricultural chemical for agronomic purposes. These seed dressings contain a dye to render the treated seed visually conspicuous. The colour of the dye varies depending upon the type of treatment and the type of grain. The current Canadian colour standards for pesticide seed treatments are: cereals–pink or red, canola–baby blue or green. Seed treated with an inoculant may have a green stain. The coatings or stains may appear greasy or powdery and surface area distribution ranges from tiny flecks to complete coverage.

Other chemical substances

Other chemical substances refers to any chemical residues either adhering to the kernel or remaining in the sample and to samples having a chemical odour of any kind.

▲ **Important:** Wear gloves and a mask to handle any samples that you suspect may contain contaminated grain.

Representative portion for analysis

Minimum—working sample
Optimum—working sample
Export—working sample

If a sample is suspected of being coated with a pesticide, desiccant, inoculant or if the sample contains evidence of any foreign chemical substance other than fertilizer pellets, the sample shall be graded *Wheat, Held IP Suspect Contaminated Grain*.

Note: Canadian Grain Commission personnel should refer to ISO national work instruction "*Suspect Contaminated Grain, Handling Procedures*" for specific procedures to be followed when handling samples suspected of containing treated seed or other chemical substances.

Wheats of other classes or varieties (WOOC)

- Other classes of wheat are all classes of wheat, including non-registered varieties, other than the predominant class in the sample.

  Contrasting classes are classes of a different colour wheat; for example, CWAD is a contrasting class in CWRS.

- Other varieties of wheat are any registered varieties.

Representative portion for analysis
Wheats of other classes or varieties

Factor	Minimum, grams	Optimum, grams
For wheats other than durum, soft white spring—		
Other classes that blend	25	50
Contrasting classes	50	100
For durum, soft white spring—		
Wheats of other classes	50	100
Other varieties of wheat	15	25

Working tolerance for wheats of other classes that blend

When assessing wheats of other classes that blend, up to 0.9% in excess of the grade specification is considered a working tolerance and disregarded.
For example, for No. 2 CWRS the tolerance is 4.5%. Samples containing up to 5.4% will still be considered within tolerance.

Note: This working tolerance only applies to registered varieties that qualify for the milling grades of wheat.

Predominant class	Wheats of other classes											
	CWRS	**CWHWS**	**CWAD**	**CWRW**	**CWSWS**	**CWES**	**CPSW**	**CPSR**	**CER[1]**	**CEAD**	**CEWW**	**CESWS**
CWRS	-	CC	CC	B	CC	B	CC	B	B	CC	CC	CC
CWHWS	CC	-	CC	CC	WOOC	CC	WOOC	CC	CC	CC	WOOC	WOOC
CWAD	WOOC	WOOC	-	WOOC	WOOC	WOOC	WOOC	WOOC	WOOC	–	WOOC	WOOC
CWRW	B	CC	CC	–	CC	B	CC	B		CC	CC	CC
CWSWS	WOOC	WOOC	WOOC	WOOC	–	WOOC	WOOC	WOOC	WOOC	WOOC	WOOC	–
CWES	B	CC	CC	B	CC	–	CC	B	B	CC	CC	CC
CPSW	CC	WOOC	CC	CC	WOOC	CC	–	CC	CC	CC	WOOC	WOOC
CPSR	B	CC	CC	B	CC	B	CC	–	B	CC	CC	CC
CER[1]		CC	CC		CC		CC		–	CC	CC	CC
CEAD	WOOC	WOOC	-	WOOC	WOOC	WOOC	WOOC	WOOC	WOOC	–	WOOC	WOOC
CEWW	CC	WOOC	CC	CC	WOOC	CC	WOOC	CC	CC	CC	–	WOOC
CESWS	WOOC	WOOC	WOOC	WOOC	–	WOOC	WOOC	WOOC	WOOC	WOOC	WOOC	–

WOOC	Wheats of other classes
CC	Contrasting classes
B	See *Working tolerance for wheats of other classes that blend*

Note: [1] CER is used for CERS, CEHRW and CESRW

Primary grade determinants tables

Wheat, Canada Western Red Spring (CWRS)

	Standard of quality					Foreign material					
Grade name	**Minimum test weight kg/hL (g/0.5 L)**	**Variety**	**Minimum hard vitreous kernels %**	**Minimum protein %**	**Degree of soundness**	**Ergot %**	**Excreta %**	**Matter other than cereal grains %**	**Sclerotinia %**	**Stones %**	**Total %**
No.1 CWRS	75 (365)	Any variety of the class CWRS designated as such by order of the Commission	65	10	Reasonably well matured, reasonably free from damaged kernels	0.01	0.01	0.2	0.01	0.03	0.6
No. 2 CWRS	72 (350)	Any variety of the class CWRS designated as such by order of the Commission	35	No minimum	Fairly well matured, may be moderately bleached or frost-damaged, reasonably free from severely damaged kernels	0.02	0.01	0.3	0.02	0.03	1.2
No. 3 CWRS	69 (335)	Any variety of the class CWRS designated as such by order of the Commission	No minimum	No minimum	May be frost-damaged, immature or weather-damaged, moderately free from severely damaged kernels	0.04	**0.015**	0.5	0.04	0.06	2.4
No. 4 CWRS	68 (330)	Any variety of the class CWRS designated as such by order of the Commission	No minimum	No minimum	May be severely frost-damaged, immature or weather-damaged, moderately free from other severely damaged kernels	0.04	**0.015**	0.5	0.04	0.06	2.4
CW Feed	65 (315)	Any class or variety of wheat excluding amber durum	No minimum	No minimum	Reasonably sweet, excluded from other grades of wheat on account of damaged kernels	0.1	0.03	1	0.1	0.1	10
Grade, if specs for CW Feed not met	*Wheat, Sample CW Account Light Weight*					*Wheat, Sample CW Account Ergot*	*Wheat, Sample CW Account Excreta*	*Wheat, Sample CW Account Admixture*	*Wheat, Sample CW Account Admixture*	2.5% or less–*Wheat, Rejected grade, Account Stones* Over 2.5%–*Wheat, Sample Salvage*	See *Mixed grain*

Wheat Canada Western Red Spring (CWRS), continued

	Wheats of other classes or varieties									Heated	
Grade name	Contrasting classes %	Total %	Artificial stain, no residue %	Dark, Immature %	Degermed %	Fireburnt %	Fusarium damage %	Grass green %	Grasshopper, army worm %	Binburnt severely mildewed rotted, mouldy %	Total %
No.1 CWRS	**0.75**	**2.3**	Nil	1	4	Nil	**0.25**	**0.75**	1	1 kernel per 1000 g	0.05
No. 2 CWRS	**2.3**	**4.5**	5K	**2.5**	7	Nil	1.0	2	3	4 kernels per 1000 g	0.4
No. 3 CWRS	**3.8**	**7.5**	10K	10	13	Nil	2.0	10	8	6 kernels per 1000 g	1.0
No. 4 CWRS	**3.8**	**7.5**	10K	10	13	Nil	2.0	10	8	6 kernels per 1000 g	1.0
CW Feed	No limit-but not more than 10% amber durum		2	No limit	No limit	2	5	No limit	No limit	**2.5**	**2.5**
Grade, if specs for CW Feed not met	Over 10% amber durum- *Wheat, Sample CW Account Admixture*		*Wheat, Sample CW Account Stained Kernels*			*Wheat, Sample CW Account Fireburnt*	*Wheat, Sample CW Account Fusarium Damage Over 10%- Wheat, Commercial Salvage*			*Wheat, Sample CW Account Heated*	

				Shrunken and broken			Smudge and blackpoint		Sprouted	
Grade name	Natural stain %	Pink %	Sawfly, midge %	Shrunken %	Broken %	Total %	Smudge %	Total %	Severely sprouted %	Total %
No.1 CWRS	0.5	**1.5**	2.0	4	5	7	30K	10	0.10	0.5
No. 2 CWRS	2	5	5	4	6	8	1	20	0.20	1.0
No. 3 CWRS	5	10	10	4	7	9	5	35	0.30	3.0
No. 4 CWRS	5	10	10	4	7	9	5	35	0.5	5
CW Feed	No limit	No limit	No limit	No limit	13	No limit within broken tolerances	No limit	No limit	No limit	No limit
Grade, if specs for CW Feed not met					*Sample Broken Grain*					

K Number of kernel-sized pieces in 500 g

Wheat, Canada Western Hard White Spring (CWHWS)

	Standard of quality				Foreign material					
Grade name	**Minimum test weight kg/hL (g/0.5 L)**	**Variety**	**Minimum protein %**	**Degree of soundness**	**Ergot %**	**Excreta %**	**Matter other than cereal grains %**	**Sclerotinia %**	**Stones %**	**Total %**
No.1 CWHWS	75 (365)	Any variety of the class CWHWS designated as such by order of the Commission	10	Reasonably well matured, reasonably free from damaged kernels	0.01	0.01	0.2	0.01	0.03	0.6
No. 2 CWHWS	75 (365)	Any variety of the class CWHWS designated as such by order of the Commission	No minimum	Fairly well matured, may be moderately bleached or frost-damaged, reasonably free from severely damaged kernels	0.02	0.01	0.3	0.02	0.03	1.2
No. 3 CWHWS	72 (350)	Any variety of the class CWHWS designated as such by order of the Commission	No minimum	May be frost-damaged, immature or weather-damaged, moderately free from severely damaged kernels	0.04	**0.015**	0.5	0.04	0.06	2.4
No. 4 CWWHS	68 (330)	Any variety of the class CWHWS designated as such by order of the Commission	No minimum	May be severely frost-damaged, immature or weather-damaged, moderately free from other severely damaged kernels	0.04	**0.015**	0.5	0.04	0.06	2.4
CW Feed	65 (315)	Any class or variety of wheat excluding amber durum	No minimum	Reasonably sweet, excluded from other grades of wheat on account of damaged kernels	0.1	0.03	1	0.1	0.1	10
Grade, if specs for CW Feed not met	*Wheat, Sample CW Account Light Weight*				*Wheat, Sample CW Account Ergot*	*Wheat, Sample CW Account Excreta*	*Wheat, Sample CW Account Admixture*	*Wheat, Sample CW Account Admixture*	2.5% or less–*Wheat, Rejected grade, Account Stones* Over 2.5%–*Wheat, Sample Salvage*	See *Mixed grain*

Wheat Canada Western Hard White Spring (CWHWS), continued

	Wheats of other classes or varieties									Heated	
Grade name	Contrasting classes %	Total %	Artificial stain, no residue %	Dark, Immature %	Degermed %	Fireburnt %	Fusarium damage %	Grass green %	Grasshopper, army worm %	Binburnt severely mildewed rotted, mouldy %	Total %
No.1 CWHWS	3.0	3	Nil	1	4	Nil	0.25	0.75	1	1 kernel per 1000 g	0.05
No. 2 CWHWS	3.0	3	5K	2.5	7	Nil	1.0	2	3	4 kernels per 1000 g	0.4
No. 3 CWHWS	5.0	5	10K	10	13	Nil	2.0	10	8	6 kernels per 1000 g	1.0
No. 4 CWHWS	5.0	5	10K	10	13	Nil	2.0	10	8	6 kernels per 1000 g	1.0
CW Feed	No limit-but not more than 10% amber durum		2	No limit	No limit	2	5	No limit	No limit	2.5	2.5
Grade, if specs for CW Feed not met	Over 10% amber durum- *Wheat, Sample CW Account Admixture*		*Wheat, Sample CW Account Stained Kernels*			*Wheat, Sample CW Account Fireburnt*	*Wheat, Sample CW Account Fusarium Damage Over 10%- Wheat, Commercial Salvage*			*Wheat, Sample CW Account Heated*	

				Shrunken and broken			Smudge and blackpoint		Sprouted	
Grade name	Natural stain %	Pink %	Sawfly, midge %	Shrunken %	Broken %	Total %	Smudge %	Total %	Severely sprouted %	Total %
No.1 CWHWS	0.5	1.5	2.0	4	5	7	30K	10	0.10	0.5
No. 2 CWHWS	2	5	5	4	6	8	1	20	0.20	1.0
No. 3 CWHWS	5	10	10	4	7	9	5	35	0.30	3.0
No. 4 CWHWS	5	10	10	4	7	9	5	35	0.5	5
CW Feed	No limit	No limit	No limit	No limit	13	No limit within broken tolerances	No limit	No limit	No limit	No limit
Grade, if specs for CW Feed not met					*Sample Broken Grain*					

K Number of kernel-sized pieces in 500 g

Wheat, Canada Western Amber Durum (CWAD)

	Standard of quality					Foreign material					
Grade name	**Minimum test weight kg/hL (g/0.5 L)**	**Variety**	**Minimum hard vitreous kernels %**	**Minimum protein %**	**Degree of soundness**	**Ergot %**	**Excreta %**	**Matter other than cereal grains %**	**Sclerotinia %**	**Stones %**	**Total %**
No. 1 CWAD	79 (387)	Any variety of the class CWAD designated as such by order of the Commission	80	9.5	Reasonably well matured, reasonably free from damaged kernels	0.01	0.01	0.2	0.01	0.03	0.5
No. 2 CWAD	77 (377)	Any variety of the class CWAD designated as such by order of the Commission	60	No minimum	Reasonably well matured, reasonably free from severely damaged kernels	0.02	0.01	0.3	0.02	0.03	1.2
No. 3 CWAD	74 (362)	Any variety of the class CWAD designated as such by order of the Commission	40	No minimum	Fairly well matured, may be moderately weather-damaged or frost-damaged, reasonably free from severely damaged kernels	0.04	0.01	0.5	0.04	0.06	1.5
No. 4 CWAD	71 (347)	Any variety of the class CWAD designated as such by order of the Commission	No minimum	No minimum	May be frost-damaged, immature or weather-damaged, moderately free from severely damaged kernels	0.04	0.01	0.5	0.04	0.06	3.0
No. 5 CWAD	No Minimum	Any variety of amber durum wheat	No minimum	No minimum	Reasonably sweet, excluded from higher grades on account of light weight or damaged kernels	0.1	0.03	1	0.1	0.1	10
Grade, if No. 5 specs not met						*Wheat, Sample CW Account Ergot*	*Wheat, Sample CW Account Excreta*	*Wheat, Sample CW Account Admixture*	*Wheat, Sample CW Account Admixture*	2.5% or less– *Rejected (grade), Account Stones* Over 2.5%– *Wheat, Sample Salvage*	See *Mixed grain*

Wheat, Canada Western Amber Durum (CWAD), continued

Grade name	Wheats of other classes or varieties		Artificial stain, no residue %	Degermed %	Fireburnt %	Fusarium damage %	Grass green %	Grasshopper, army worm %	Heated	
	Other classes %	Total %							Binburnt severely mildewed rotted, mouldy %	Total %
No. 1 CWAD	2.0	4	Nil	4	Nil	0.5	**0.75**	1	1 kernel per 1000 g	0.05
No. 2 CWAD	3.0	**7.5**	3K	7	Nil	0.5	2	3	2 kernels per 1000 g	0.1
No. 3 CWAD	**4.3**	11	7K	10	Nil	2.0	4	5	4 kernels per 1000 g	0.4
No. 4 CWAD	10	49	12K	13	Nil	2.0	10	8	0.5	1.5
No. 5 CWAD	49	No limit	2	No limit	2	5	No limit	No limit	5	5
Grade, if No. 5 specs not met	*Wheat, Sample CW Account Admixture*		*Wheat, Sample CW Account Stained Kernels*		*Wheat, Sample CW Account Fireburnt*	*Wheat, Sample CW Account Fusarium Damage* *Over 10%- Wheat, Commercial Salvage*			*Wheat, Sample CW Account Heated*	

Grade name	Natural stain %	Pink %	Severe midge %	Sawfly, midge %	Shrunken and broken			Smudge and blackpoint				Sprouted	
					Shrunken %	Broken %	Total %	Penetrated smudge %	Red smudge %	Total smudge %	Total %	Severely sprouted %	Total %
No. 1 CWAD	0.5	3	0.1	2.0	3	6	7	3K	30K	30K	5	0.10	0.5
No. 2 CWAD	2	6	**0.25**	8	3	8	9	**0.25**	1	1	10	0.20	2
No. 3 CWAD	5	10	**0.75**	15	3	10	11	0.5	1	3	20	8	8
No. 4 CWAD	**7.5**	No limit	2	40	3	11	12	Consider overall appearance				12	12
No. 5 CWAD	No limit	No limit	No limit	No limit	No limit	13	No limit within broken tolerances	No limit				No limit	No limit
Grade, if No. 5 specs not met						*Sample Broken Grain*							

Wheat, Canada Western Red Winter (CWRW)

	Standard of quality					Foreign material					
Grade name	Minimum test weight kg/hL (g/0.5 L)	Variety	Minimum hard vitreous kernels %	Minimum protein %	Degree of soundness	Ergot %	Excreta %	Matter other than cereal grains %	Sclerotinia %	Stones %	Total %
No. 1 CWRW	78 (380)	Any variety of the class CWRW designated as such by order of the Commission	50	9	Reasonably well matured, reasonably free from damaged kernels	0.01	0.01	0.2	0.01	0.03	1.0
No. 2 CWRW	74 (360)	Any variety of the class CWRW designated as such by order of the Commission	No minimum	No minimum	May be frost-damaged, immature or weather-damaged, moderately free from severely damaged kernels	0.04	**0.015**	0.5	0.04	0.06	2.0
CW Feed	65 (315)	Any class or variety of wheat excluding amber durum	No minimum	No minimum	Reasonably sweet, excluded from higher grades on account of light weight or damaged kernels	0.1	0.03	1	0.1	0.1	10
Grade, if specs for CW Feed not met	*Wheat, Sample CW Account Light Weight*					*Wheat, Sample CW Account Ergot*	*Wheat, Sample CW Account Excreta*	*Wheat, Sample CW Account Admixture*	*Wheat, Sample CW Account Admixture*	2.5% or less– *Rejected (grade) Account Stones* Over 2.5%– *Wheat, Sample Salvage*	See *Mixed grain*

Wheat, Canada Western Red Winter (CWRW), continued

Grade name	Wheats of other classes or varieties		Artificial stain, no residue %	Dark, Immature %	Degermed %	Fireburnt %	Fusarium damage %	Grass green %	Grasshopper, army worm %	Heated	
	Contrasting classes %	Total %								Binburnt severely mildewed rotted, mouldy %	Total %
No. 1 CWRW	1.0	3	Nil	1	4	Nil	2.0	0.75	1	1 kernel per 1000 g	0.05
No. 2 CWRW	2.5	6	7K	10	10	Nil	2.0	4	5	2 kernels per 1000 g	0.1
CW Feed	No limit-but not more than 10% amber durum		2	No limit	No limit	2	5	No limit	No limit	2.5	2.5
Grade, if specs for CW Feed not met	Over 10% amber durum- *Wheat, Sample CW Account Admixture*		*Wheat, Sample CW Account Stained Kernels*			*Wheat, Sample CW Account Fireburnt*	*Wheat, Sample CW Account Fusarium Damage* Over 10% - *Wheat, Commercial Salvage*			*Wheat, Sample CW Account Heated*	

Grade name	Natural stain %	Pink %	Sawfly, midge %	Shrunken and broken			Smudge and blackpoint			Sprouted	
				Shrunken %	Broken %	Total %	Penetrated smudge %	Total smudge %	Total %	Severely sprouted %	Total %
No. 1 CWRW	0.5	3	1.0	3	5	7	3K	30K	10	0.10	0.5
No. 2 CWRW	5	10	5	3	7	9	1.0	3	35	0.30	2.5
CW Feed	No limit	No limit	No limit	No limit	13	No limit within broken tolerances	No limit	No limit	No limit	No limit	No limit
Grade, if specs for CW Feed not met					*Sample Broken Grain*						

K Number of kernel-sized pieces in 500 g

Wheat, Canada Western Soft White Spring (CWSWS)

	Standard of quality			Foreign material					
Grade name	**Minimum test weight kg/hL (g/0.5 L)**	**Variety**	**Degree of soundness**	**Ergot %**	**Excreta %**	**Matter other than cereal grains %**	**Sclerotinia %**	**Stones %**	**Total %**
No. 1 CWSWS	76 (370)	Any variety of the class CWSWS designated as such by order of the Commission	Reasonably well matured, reasonably free from damaged kernels	0.01	0.01	0.2	0.01	0.03	1.0
No. 2 CWSWS	74 (360)	Any variety of the class CWSWS designated as such by order of the Commission	Fairly well matured, may be moderately weather-damaged, reasonably free from severely damaged kernels	0.02	0.01	0.3	0.02	0.03	2.0
No. 3 CWSWS	69 (335)	Any variety of the class CWSWS designated as such by order of the Commission	May be frost-damaged, immature or weather-damaged, moderately free from severely damaged kernels	0.04	**0.015**	0.5	0.04	0.06	3.0
CW Feed	65 (315)	Any class or variety of wheat excluding amber durum	Reasonably sweet, excluded from higher grades on account of light weight or damaged kernels	0.1	0.03	1	0.1	0.1	10
Grade, if specs for CW Feed not met	*Wheat, Sample CW Account Light Weight*			*Wheat, Sample CW Account Ergot*	*Wheat, Sample CW Account Excreta*	*Wheat, Sample CW Account Admixture*	*Wheat, Sample CW Account Admixture*	2.5% or less– *Rejected (grade) Account Stones* Over 2.5%– *Wheat, Sample Salvage*	See *Mixed grain*

Wheat, Canada Western Soft White Spring (CWSWS), continued

Grade name	Wheats of other classes or varieties %	Artificial stain, no residue %	Degermed %	Fireburnt %	Fusarium damage %	Grass green %	Grasshopper, army worm %	Heated	
								Binburnt, severely mildewed rotted, mouldy %	Total %
No. 1 CWSWS	3	Nil	4	Nil	2.0	0.75	1	1 kernel per 1000 g	0.05
No. 2 CWSWS	6	3K	7	Nil	2.0	2	3	2 kernels per 1000 g	0.1
No. 3 CWSWS	10	7K	10	Nil	2.0	4	5	4 kernels per 1000 g	0.4
CW Feed	No limit–but not more than 10% amber durum	2	No limit	2	5	No limit	No limit	2.5	2.5
Grade, if specs for CW Feed not met	Over 10% amber durum– *Wheat, Sample CW Account Admixture*	*Wheat, Sample CW Account Stained Kernels*		*Wheat, Sample CW Account Fireburnt*	10% or less–*Wheat, Sample CW Account Fusarium Damage* Over 10%– *Wheat, Commercial Salvage*			*Wheat, Sample CW Account Heated*	

Grade name	Natural stain %	Pink %	Sawfly, midge %	Shrunken and broken			Smudge and blackpoint			Sprouted	
				Shrunken %	Broken %	Total %	Penetrated smudge %	Total smudge %	Total %	Severely sprouted %	Total %
No. 1 CWSWS	0.5	3	2.0	3	5	7	3K	30K	10	0.10	1
No. 2 CWSWS	2	6	8	3	6	8	0.5	1	15	0.30	5
No. 3 CWSWS	5	10	15	3	7	9	1.0	3	35	0.50	8
CW Feed	No limit	No limit	No limit	No limit	13	No limit within broken tolerances	No limit	No limit	No limit	No limit	No limit
Grade, if specs for CW Feed not met					*Sample Broken Grain*						

K Number of kernel-sized pieces in 500 g

Wheat, Canada Western Extra Strong (CWES)

	Standard of quality				Foreign material					
Grade name	**Minimum test weight kg/hL (g/0.5 L)**	**Variety**	**Minimum protein %**	**Degree of soundness**	**Ergot %**	**Excreta %**	**Matter other than cereal grains %**	**Sclerotinia %**	**Stones %**	**Total %**
No. 1 CWES	75 (365)	Any variety of the class CWES designated as such by order of the Commission	10	Fairly well matured, may be moderately bleached or frost-damaged, reasonably free from severely damaged kernels	0.03	0.01	0.2	0.03	0.03	0.75
No. 2 CWES	73 (355)	Any variety of the class CWES designated as such by order of the Commission	No minimum	May be frost-damaged, immature or weather-damaged, moderately free from severely damaged kernels	0.06	0.03	0.3	0.06	0.06	1.5
CW Feed	65 (315)	Any class or variety of wheat excluding amber durum	No minimum	Reasonably sweet, excluded from higher grades on account of light weight or damaged kernels	0.1	0.03	1	0.1	0.1	10
Grade, if specs for CW Feed not met	*Wheat, Sample CW Account Light Weight*				*Wheat, Sample CW Account Ergot*	*Wheat, Sample CW Account Excreta*	*Wheat, Sample CW Account Admixture*	*Wheat, Sample CW Account Admixture*	2.5% or less– *Rejected(grade) Account Stones* Over 2.5%– *Wheat, Sample Salvage*	See *Mixed grain*

Wheat, Canada Western Extra Strong (CWES), continued

Grade name	Wheats of other classes or varieties		Artificial stain, no residue %	Degermed %	Fireburnt %	Fusarium damage %	Grass green %	Grasshopper, army worm %	Heated	
	Contrasting classes %	Total %							Binburnt severely mildewed rotted, mouldy %	Total %
No. 1 CWES	1.5	3	5K	7	Nil	1.0	2	3	4 kernels per 1000 g	0.4
No. 2 CWES	2.5	5	10K	13	Nil	1.0	10	8	6 kernels per 1000 g	1.0
CW Feed	No limit-but not more than 10% amber durum		2	No limit	2	5	No limit	No limit	2.5	2.5
Grade, if CW Feed specs not met	Over 10% amber durum- *Wheat, Sample CW Account Admixture*		*Wheat, Sample CW Account Stained Kernels*		*Wheat, Sample CW Account Fireburnt*	*10% or less–Wheat, Sample CW Account Fusarium Damage* Over 10%– *Wheat Commercial Salvage*			*Wheat, Sample CW Account Heated*	

Grade name	Natural stain %	Pink %	Sawfly, midge %	Shrunken and broken			Smudge and blackpoint		Sprouted	
				Shrunken %	Broken %	Total %	Smudge %	Total %	Severely sprouted %	Total %
No. 1 CWES	2	5	2.0	3	7	8	1	15	0.10	0.5
No. 2 CWES	5	10	5	3	7	8	Consider overall appearance		0.30	2
CW Feed	No limit	No limit	No limit	No limit	13	No limit within broken tolerances	No limit		No limit	No limit
Grade, if CW Feed specs not met					*Sample Broken Grain*					

K Number of kernel-sized pieces in 500 g

Wheat, Canada Prairie Spring White (CPSW)

	Standard of quality			Foreign material					
Grade name	Minimum test weight kg/hL (g/0.5 L)	Variety	Degree of soundness	Ergot %	Excreta %	Matter other than cereal grains %	Sclerotinia %	Stones %	Total %
No. 1 CPSW	77 (375)	Any variety of the class CPSW designated as such by order of the Commission	Fairly well matured, may be moderately bleached or frost-damaged, reasonably free from severely damaged kernels	0.03	0.01	0.2	0.03	0.03	0.75
No. 2 CPSW	75 (365)	Any variety of the class CPSW designated as such by order of the Commission	May be frost-damaged, immature or weather-damaged, moderately free from severely damaged kernels	0.06	0.03	0.3	0.06	0.03	1.5
CW/CE Feed	65 (315)	Any class or variety of wheat excluding amber durum	Reasonably sweet, excluded from higher grades on account of light weight or damaged kernels	0.1	0.03	1	0.1	0.1	10
Grade, if specs for CW/CE Feed not met	*Wheat, Sample CW Account Light Weight*			*Wheat, Sample Canada Account Ergot*	*Wheat, Sample Canada Account Excreta*	*Wheat, Sample Canada Account Admixture*	*Wheat, Sample Canada Account Admixture*	2.5% or less– *Rejected (grade) Account Stones* or *Wheat, Sample Canada Account Stones* Over 2.5%– *Wheat, Sample Salvage*	See *Mixed grain*

Canada Prairie Spring White (CPSW) continued

Grade name	Wheats of other classes or varieties		Artificial stain, no residue %	Dark immature %	Degermed %	Fireburnt %	Fusarium damage %	Grass green %	Grasshopper, army worm %	Heated	
	Contrasting classes %	Total %								Binburnt severely mildewed rotted, mouldy %	Total %
No. 1 CPSW	3	5	5K	2.5	7	Nil	2.0	2	3	4 kernels per 1000 g	0.4
No. 2 CPSW	5	10	10K	10	13	Nil	2.0	10	8	6 kernels per 1000 g	1.0
CW/CE Feed	No limit–but not more than10% amber durum		2	No limit	No limit	2	5	No limit	No limit	2.5	2.5
Grade, if specs for CW/CE Feed not met	Over 10% amber durum–*Wheat, Sample Canada Account Admixture*		*Wheat, Sample Canada Account Stained Kernels*			*Wheat, Sample Canada Account Fireburnt*	10% or less–*Wheat, Sample Canada Account Fusarium Damage* Over 10%– *Wheat, Commercial Salvage*			*Wheat, Sample Canada Account Heated*	

Grade name	Natural stain %	Pink %	Sawfly, midge %	Shrunken and broken			Smudge and blackpoint			Sprouted	
				Shrunken %	Broken %	Total %	Penetrated smudge %	Total smudge %	Total %	Severely sprouted %	Total %
No. 1 CPSW	2	5	3	5	6	9	10K	1	20	0.10	0.5
No. 2 CPSW	5	10	8	5	6	9	0.5	5	35	0.30	2
CW/CE Feed	No limit	No limit	No limit	No limit	13	No limit within broken tolerances	No limit	No limit	No limit	No limit	No limit
Grade, if specs for CW/CE Feed not met					*Sample Broken Grain*						

K Number of kernel-sized pieces in 500 g

Wheat, Canada Prairie Spring Red (CPSR)

	Standard of quality			Foreign material					
Grade name	**Minimum test weight kg/hL (g/0.5 L)**	**Variety**	**Degree of soundness**	**Ergot %**	**Excreta %**	**Matter other than cereal grains %**	**Sclerotinia %**	**Stones %**	**Total %**
No. 1 CPSR	77 (375)	Any variety of the class CPSR designated as such by order of the Commission	Fairly well matured, may be moderately bleached or frost-damaged, reasonably free from severely damaged kernels	0.03	0.01	0.2	0.03	0.03	0.75
No. 2 CPSR	75 (365)	Any variety of the class CPSR designated as such by order of the Commission	May be frost-damaged, immature or weather-damaged, moderately free from severely damaged kernels	0.06	0.03	0.3	0.06	0.03	1.5
CW/CE Feed	65 (315)	Any class or variety of wheat excluding amber durum	Reasonably sweet, excluded from higher grades on account of light weight or damaged kernels	0.1	0.03	1	0.1	0.1	10
Grade, if specs for CW/CE Feed not met	*Wheat, Sample Canada, Account Light Weight*			*Wheat, Sample Canada Account Ergot*	*Wheat, Sample Canada Account Excreta*	*Wheat Sample Canada Account Admixture*	*Wheat, Sample Canada Account Admixture*	2.5% or less– *Rejected (grade) Account Stones* or *Wheat, Sample Canada Account Stones* Over 2.5%– *Wheat, Sample Salvage*	See *Mixed Grain*

Wheat, Canada Prairie Spring Red (CPSR), continued

Grade name	Wheats of other classes or varieties		Artificial stain, no residue %	Dark immature %	Degermed %	Fireburnt %	Fusarium damage %	Grass green %	Grasshopper %	Heated	
	Contrasting classes %	Total %								Binburnt severely mildewed rotted, mouldy %	Total %
No. 1 CPSR	3	5	5K	2.5	7	Nil	2.0	2	3	4 kernels per 1000 g	0.4
No. 2 CPSR	5	10	10K	10	13	Nil	2.0	10	8	6 kernels per 1000 g	1.0
CW/CE Feed	No limit–but not more than 10% amber durum		2	No limit	No limit	2	5	No limit	No limit	2.5	2.5
Grade, if specs for CW/CE Feed not met	Over 10% amber durum–*Wheat, Sample Canada Account Admixture*		*Wheat, Sample Canada Account Stained Kernels*			*Wheat, Sample Canada Account Fireburnt*	10% or less–*Wheat, Sample Canada Account Fusarium Damage* Over 10%– *Wheat, Commercial Salvage*			*Wheat, Sample Canada Account Heated*	

Grade name	Natural stain %	Pink %	Sawfly, midge %	Shrunken and broken			Smudge and blackpoint			Sprouted	
				Shrunken %	Broken %	Total %	Penetrated smudge %	Total smudge %	Total %	Severely sprouted %	Total %
No. 1 CPSR	2	5	3	5	6	9	10K	1	20	0.10	0.5
No. 2 CPSR	5	10	8	5	6	9	0.5	5	35	0.30	2
CW/CE Feed	No limit	No limit	No limit	No limit	13	No limit within broken tolerances	No limit	No limit	No limit	No limit	No limit
Grade, if specs for CW/CE Feed not met					*Sample Broken Grain*						

K Number of kernel-sized pieces in 500 g

Wheat, Canada Eastern Red (CER)

	Standard of quality			Foreign material					
Grade name	**Minimum test weight kg/hL (g/0.5 L)**	**Variety**	**Degree of soundness**	**Ergot %**	**Excreta %**	**Matter other than cereal grains %**	**Sclerotinia %**	**Stones %**	**Total %**
No. 1 CER	75 (365)	Any registered variety of red wheat	Reasonably well matured, reasonably free from damaged kernels	0.01	0.01	0.2	0.01	0.03	**0.75**
No. 2 CER	72 (350)	Any registered variety of red wheat	Fairly well matured, reasonably free from severely damaged kernels	0.02	**0.015**	0.3	0.02	0.03	1.5
No. 3 CER	69 (335)	Any registered variety of red wheat	May be frost-damaged, immature or weather-damaged, moderately free from severely damaged kernels	0.04	**0.015**	0.5	0.04	0.06	3.5
CE Feed	65 (315)	Any class or variety of wheat excluding amber durum	Reasonably sweet, excluded from higher grades on account of light weight or damaged kernels	0.1	0.03	1	**0.25**	0.1	10
Grade, if specs for CE Feed not met	*Wheat, Sample CE Account Light Weight*			*Wheat, Sample CE Account Ergot*	*Sample CE Account Excreta*	*Wheat, Sample CE Account Admixture*	*Wheat, Sample CE Account Admixture*	2.5% or less– *Wheat, Sample CE Account Stones* Over 2.5%– *Wheat, Sample Salvage*	See *Mixed grain*

Wheat, Canada Eastern Red (CER), continued

Grade name	Contrasting classes %	Artificial stain, no residue %	Dark immature %	Degermed %	Fireburnt %	Fusarium damage %	Grass green %	Grasshopper, army worm %	Heated	
									Binburnt, severely mildewedrotted, mouldy %	Total %
No. 1 CER	1.0	Nil	1	4	Nil	1.0	0.75	1	2K	0.1
No. 2 CER	3	3K	2.5	7	Nil	1.0	2	3	5K	0.75
No. 3 CER	5	7K	10	10	Nil	1.0	4	5	10K	2.0
CE Feed	No limit–but not more than 10% amber durum	2	No limit	No limit	2	5	No limit	No limit	10	10
Grade, if specs for CE Feed not met	50% or less amber durum–*Wheat, Sample CE Account Admixture*	*Wheat, Sample CE Account Stained Kernels*			*Wheat, Sample CE Account Fireburnt*	*Wheat, Sample CE Account Fusarium Damage*			*Wheat, Sample CE Account Heated*	*Wheat, Sample CE Account Heated*

Grade name	Natural stain %	Pink %	Sawfly, midge %	Shrunken and broken			Smudge and blackpoint			Sprouted %
				Shrunken %	Broken %	Total %	Penetrated smudge %	Total smudge %	Total %	
No. 1 CER	0.5	1.5	2.0	6	6	7	3K	30K	10	0.5
No. 2 CER	2	5	8	10	10	11	0.5	1	20	2.5
No. 3 CER	5	10	15	12	10	13	1.0	5	35	8
CE Feed	No limit	No limit	No limit	No limit	50	No limit within broken tolerances	No limit	No limit	No limit	No limit
Grade, if specs for CE Feed not met					*Sample Broken Grain*					

K Number of kernel-sized pieces in 500 g

Wheat, Canada Eastern Red Spring (CERS)

	Standard of quality			Foreign material					
Grade name	**Minimum test weight kg/hL (g/0.5 L)**	**Variety**	**Degree of soundness**	**Ergot %**	**Excreta %**	**Matter other than cereal grains %**	**Sclerotinia %**	**Stones %**	**Total %**
No. 1 CERS	75 (365)	Any variety of the class CERS designated as such by order of the Commission	Reasonably well matured, reasonably free from damaged kernels	0.01	0.01	0.2	0.01	0.03	**0.75**
No. 2 CERS	72 (350)	Any variety of the class CERS designated as such by order of the Commission	Fairly well matured, may be moderately weather-damaged, reasonably free from severely damaged kernels	0.02	**0.015**	0.3	0.02	0.03	1.5
No. 3 CERS	69 (335)	Any variety of the class CERS designated as such by order of the Commission	May be immature or weather-damaged, moderately free from severely damaged kernels	0.04	**0.015**	0.5	0.04	0.06	3.5
CE Feed	65 (315)	Any class or variety of wheat excluding amber durum	Reasonably sweet, excluded from other grades of wheat on account of damaged kernels	0.1	0.03	1	**0.25**	0.1	10
Grade, if specs for CE Feed not met	*Wheat, Sample CE Account Light Weight*			*Wheat, Sample CE Account Ergot*	*Wheat, Sample CE Account Excreta*	*Wheat, Sample CE Account Admixture*	*Wheat, Sample CE Account Admixture*	2.5% or less– *Wheat, Sample CE Account Stones* Over 2.5%– *Wheat, Sample Salvage*	See *Mixed grain*

Wheat, Canada Eastern Red Spring (CERS), continued

Grade name	Contrasting classes %	Artificial stain, no residue %	Dark immature %	Degermed %	Fireburnt %	Fusarium damage %	Grass green %	Grasshopper, army worm %	Heated	
									Binburnt, severely mildewed rotted, mouldy %	Total %
No. 1 CERS	1.0	Nil	1	4	Nil	1.0	0.75	1	2K	0.1
No. 2 CERS	3	3K	2.5	7	Nil	1.0	2	3	5K	0.75
No. 3 CERS	5	7K	10	10	Nil	1.0	4	5	10K	2.0
CE Feed	No limit–but not more than 10% amber durum	2	No limit	No limit	2	5	No limit	No limit	10	10
Grade, if specs for CE Feed not met	50% or less amber durum–*Wheat, Sample CE Account Admixture*	*Wheat, Sample CE Account Stained Kernels*			*Wheat, Sample CE Account Fireburnt*	*Wheat, Sample CE Account Fusarium Damage*			*Wheat, Sample CE Account Heated*	*Wheat, Sample CE Account Heated*

Grade name	Natural stain %	Pink %	Sawfly, midge %	Shrunken and broken			Smudge and blackpoint			Sprouted %
				Shrunken %	Broken %	Total %	Penetrated smudge %	Total smudge %	Total %	
No. 1 CERS	0.5	1.5	2.0	6	6	7	3K	30K	10	0.5
No. 2 CERS	2	5	8	10	10	11	0.5	1	20	2.5
No. 3 CERS	5	10	15	12	10	13	1.0	5	35	8
CE Feed	No limit	No limit	No limit	No limit	50	No limit within broken tolerances	No limit	No limit	No limit	No limit
Grade, if specs for CE Feed not met					*Sample Broken Grain*					

K Number of kernel-sized pieces in 500 g

Wheat, Canada Eastern Hard Red Winter (CEHRW)

	Standard of quality			Foreign material					
Grade name	**Minimum test weight kg/hL (g/0.5 L)**	**Variety**	**Degree of soundness**	**Ergot %**	**Excreta %**	**Matter other than cereal grains %**	**Sclerotinia %**	**Stones %**	**Total %**
No. 1 CEHRW	76 (370)	Any variety of the class CEHRW designated as such by order of the Commission	Reasonably well matured, reasonably free from damaged kernels	0.01	0.01	0.2	0.01	0.03	**0.75**
No. 2 CEHRW	74 (360)	Any variety of the class CEHRW designated as such by order of the Commission	Fairly well matured, may be moderately weather-damaged, reasonably free from severely damaged kernels	0.02	**0.015**	0.3	0.02	0.03	1.5
No. 3 CEHRW	69 (335)	Any variety of the class CEHRW designated as such by order of the Commission	May be immature or weather-damaged, moderately free from severely damaged kernels	0.04	**0.015**	0.5	0.04	0.06	3.5
CE Feed	65 (315)	Any class or variety of wheat excluding amber durum	Reasonably sweet, excluded from other grades of wheat on account of damaged kernels	0.1	0.03	1	**0.25**	0.1	10
Grade, if specs for CE Feed not met	*Wheat, Sample CE Account Light Weight*			*Wheat, Sample CE Account Ergot*	*Wheat, Sample CE Account Excreta*	*Wheat, Sample CE Account Admixture*	*Wheat, Sample CE Account Admixture*	2.5% or less– *Wheat, Sample CE Account Stones* Over 2.5%– *Wheat, Sample Salvage*	See *Mixed grain*

Wheat, Canada Eastern Hard Red Winter (CEHRW), continued

Grade name	Contrasting classes %	Artificial stain, no residue %	Dark immature %	Degermed %	Fireburnt %	Fusarium damage %	Grass green %	Grasshopper, army worm %	Heated	
									Binburnt, severely mildewedrotted, mouldy %	Total %
No. 1 CEHRW	1.0	Nil	1	4	Nil	1.0	0.75	1	2K	0.1
No. 2 CEHRW	3	3K	2.5	7	Nil	1.0	2	3	5K	0.75
No. 3 CEHRW	5	7K	10	10	Nil	1.0	4	5	10K	2.0
CE Feed	No limit–but not more than 10% amber durum	2	No limit	No limit	2	5	No limit	No limit	10	10
Grade, if specs for CE Feed not met	50% or less amber durum–*Wheat, Sample CE Account Admixture*	*Wheat, Sample CE Account Stained Kernels*			*Wheat, Sample CE Account Fireburnt*	*Wheat, Sample CE Account Fusarium Damage*			*Wheat, Sample CE Account Heated*	*Wheat, Sample CE Account Heated*

Grade name	Natural stain %	Pink %	Sawfly, midge %	Shrunken and broken			Smudge and blackpoint			Sprouted %
				Shrunken %	Broken %	Total %	Penetrated smudge %	Total smudge %	Total %	
No. 1 CEHRW	0.5	1.5	2.0	6	6	7	3K	30K	10	0.5
No. 2 CEHRW	2	5	8	10	10	11	0.5	1	20	2.5
No. 3 CEHRW	5	10	15	12	10	13	1.0	5	35	8
CE Feed	No limit	No limit	No limit	No limit	50	No limit within broken tolerances	No limit	No limit	No limit	No limit
Grade, if specs for CE Feed not met					*Sample Broken Grain*					

K Number of kernel-sized pieces in 500 g

Wheat, Canada Eastern Soft Red Winter (CESRW)

	Standard of quality			Foreign material					
Grade name	Minimum test weight kg/hL (g/0.5 L)	Variety	Degree of soundness	Ergot %	Excreta %	Matter other than cereal grains %	Sclerotinia %	Stones %	Total %
No. 1 CESRW	76 (370)	Any variety of the class CESRW designated as such by order of the Commission	Reasonably well matured, reasonably free from damaged kernels	0.01	0.01	0.2	0.01	0.03	**0.75**
No. 2 CESRW	74 (360)	Any variety of the class CESRW designated as such by order of the Commission	Fairly well matured, may be moderately weather-damaged, reasonably free from severely damaged kernels	0.02	**0.015**	0.3	0.02	0.03	1.5
No. 3 CESRW	69 (335)	Any variety of the class CESRW designated as such by order of the Commission	May be immature or weather-damaged, moderately free from severely damaged kernels	0.04	**0.015**	0.5	0.04	0.06	3.5
CE Feed	65 (315)	Any class or variety of wheat excluding amber durum	Reasonably sweet, excluded from other grades of wheat on account of damaged kernels	0.1	0.03	1	**0.25**	0.1	10
Grade, if specs for CE Feed not met	*Wheat, Sample CE Account Light Weight*			*Wheat, Sample CE Account Ergot*	*Wheat, Sample CE Account Excreta*	*Wheat, Sample CE Account Admixture*	*Wheat, Sample CE Account Admixture*	2.5% or less– *Wheat, Sample CE Account Stones* Over 2.5%– *Wheat, Sample Salvage*	See *Mixed grain*

Wheat, Canada Eastern Soft Red Winter (CESRW), continued

									Heated	
Grade name	**Contrasting classes %**	**Artificial stain, no residue %**	**Dark immature %**	**Degermed %**	**Fireburnt %**	**Fusarium damage %**	**Grass green %**	**Grasshopper, army worm %**	**Binburnt, severely mildewedrotted, mouldy %**	**Total %**
No. 1 CESRW	1.0	Nil	1	4	Nil	1.0	0.75	1	2K	0.1
No. 2 CESRW	3	3K	2.5	7	Nil	1.0	2	3	5K	0.75
No. 3 CESRW	5	7K	10	10	Nil	1.0	4	5	10K	2.0
CE Feed	No limit–but not more than 10% amber durum	2	No limit	No limit	2	5	No limit	No limit	10	10
Grade, if specs for CE Feed not met	50% or less amber durum–*Wheat, Sample CE Account Admixture*	*Wheat, Sample CE Account Stained Kernels*			*Wheat, Sample CE Account Fireburnt*	*Wheat, Sample CE Account Fusarium Damage*			*Wheat, Sample CE Account Heated*	*Wheat, Sample CE Account Heated*

				Shrunken and broken			Smudge and blackpoint			
Grade name	**Natural stain %**	**Pink %**	**Sawfly, midge %**	**Shrunken %**	**Broken %**	**Total %**	**Penetrated smudge %**	**Total smudge %**	**Total %**	**Sprouted %**
No. 1 CESRW	0.5	1.5	2.0	6	6	7	3K	30K	10	0.5
No. 2 CESRW	2	5	8	10	10	11	0.5	1	20	2.5
No. 3 CESRW	5	10	15	12	10	13	1.0	5	35	8
CE Feed	No limit	No limit	No limit	No limit	50	No limit within broken tolerances	No limit	No limit	No limit	No limit
Grade, if specs for CE Feed not met					*Sample Broken Grain*					

K Number of kernel-sized pieces in 500 g

Wheat, Canada Eastern Amber Durum (CEAD)

	Standard of quality				Foreign material					
Grade name	**Minimum test weight kg/hL (g/0.5 L)**	**Variety**	**Minimum hard vitreous kernels %**	**Degree of soundness**	**Ergot %**	**Excreta %**	**Matter other than cereal grains %**	**Sclerotinia %**	**Stones %**	**Total %**
No. 1 CEAD	79 (387)	Any variety of the class CEAD designated as such by order of the Commission	80	Reasonably well matured, reasonably free from damaged kernels	0.01	0.01	0.2	0.01	0.03	0.5
No. 2 CEAD	77 (377)	Any variety of the class CEAD designated as such by order of the Commission	60	Reasonably well matured, reasonably free from severely damaged kernels	0.02	0.01	0.3	0.02	0.03	1.5
No. 3 CEAD	74 (362)	Any variety of the class CEAD designated as such by order of the Commission	40	Fairly well matured, may be moderately weather-damaged or frost-damaged, reasonably free from severely damaged kernels	0.04	0.01	0.5	0.04	0.03	2.0
CE Feed Durum	No minimum	Any variety of amber durum wheat	No minimum	Reasonably sweet, excluded from higher grades on account of light weight or damaged kernels	0.1	0.03	1	**0.25**	0.1	10
Grade, if specs for Feed Durum not met					*Wheat, Sample CE Account Ergot*	*Wheat, Sample CE Account Excreta*	*Wheat, Sample CE Account Admixture*	*Wheat, Sample CE Account Admixture*	2.5% or less– *Wheat, Sample CE Account Stones* Over 2.5%– *Wheat, Sample Salvage*	See *Mixed grain*

Wheat, Canada Eastern Amber Durum (CEAD), continued

Grade name	Wheats of other classes or varieties		Artificial stain, no residue %	Degermed %	Fireburnt %	Fusarium damage %	Grass green %	Grasshopper army worm%	Heated	
	Other classes %	Total %							Binburnt, severely mildewed, rotted, mouldy %	Total %
No. 1 CEAD	2	5	Nil	4	Nil	1.0	0.75	1	2K	0.1
No. 2 CEAD	3.5	10	3K	7	Nil	1.0	2	3	4K	0.25
No. 3 CEAD	5	15	7K	10	Nil	1.0	4	5	6K	0.75
CE Feed Durum	49	No limit	2	No limit	2	5	No limit	No limit	10	10
Grade, if specs for Feed Durum not met	*Wheat, Sample CE Account Admixture*		*Wheat, Sample CE Account Stained Kernels*		*Wheat, Sample CE Account Fireburnt*	*Wheat, Sample CE Account Fusarium Damage*			*Wheat, Sample CE Account Heated*	*Wheat, Sample CE Account Heated*

Grade name	Natural stain %	Pink %	Sawfly, midge %	Shrunken and broken			Smudge and blackpoint				Sprouted %
				Shrunken %	Broken %	Total %	Penetrated smudge %	Red smudge %	Total smudge %	Total %	
No. 1 CEAD	0.5	3	2.0	6	6	7	3K	30K	30K	10	0.5
No. 2 CEAD	2	6	8	10	10	10	0.5	1.0	1	15	2
No. 3 CEAD	5	10	15	12	10	15	1.0	1.5	3	35	8
CE Feed Durum	No limit	No limit	No limit	No limit	50	No limit within broken tolerances	No limit	No limit	No limit	No limit	No limit
Grade, if specs for Feed Durum not met					*Sample Broken Grain*			**No. 3 CWRS**	2.5	5	No minimum

0.30 3.

K Number of kernel-sized pieces in 500 g

Wheat, Canada Eastern White Winter (CEWW)

	Standard of quality			Foreign material					
Grade name	**Minimum test weight kg/hL (g/0.5 L)**	**Variety**	**Degree of soundness**	**Ergot %**	**Excreta %**	**Matter other than cereal grains %**	**Sclerotinia %**	**Stones %**	**Total %**
No. 1 CEWW	76 (370)	Any variety of the class CEWW designated as such by order of the Commission	Reasonably well matured, reasonably free from damaged kernels	0.01	0.01	0.2	0.01	0.03	1.0
No. 2 CEWW	74 (360)	Any variety of the class CEWW designated as such by order of the Commission	Fairly well matured, may be moderately weather-damaged, reasonably free from severely damaged kernels	0.02	**0.015**	0.3	0.02	0.03	2.0
No. 3 CEWW	69 (335)	Any variety of the class CEWW designated as such by order of the Commission	May be immature or weather-damaged, moderately free from severely damaged kernels	0.04	**0.015**	0.5	0.04	0.03	3.0
CE Feed	65 (315)	Any class or variety of wheat excluding amber durum	Reasonably sweet, excluded from other grades of wheat on account of damaged kernels	0.1	0.03	1	**0.25**	0.1	10
Grade, if specs for CE Feed not met	*Wheat, Sample CE Account Light Weight*			*Wheat, Sample CE Account Ergot*	*Wheat, Sample CE Account Excreta*	*Wheat, Sample CE Account Admixture*	*Wheat, Sample CE Account Admixture*	2.5% or less– *Wheat, Sample CE Account Stones* Over 2.5%– *Wheat, Sample Salvage*	See *Mixed grain*

Wheat, Canada Eastern White Winter (CEWW), continued

	Wheats of other classes or varieties								Heated	
Grade name	**Contrasting classes %**	**Total %**	**Artificial stain, no residue %**	**Degermed %**	**Fireburnt %**	**Fusarium damage %**	**Grass green %**	**Grasshopper army worm %**	**Binburnt, severely mildewed, rotted, mouldy %**	**Total %**
No. 1 CEWW	1.0	5	Nil	4	Nil	1.0	0.75	1	2K	0.1
No. 2 CEWW	2.0	6	3K	7	Nil	1.0	2	3	4K	0.25
No. 3 CEWW	3	10	7K	10	Nil	1.0	4	5	6K	0.75
CE Feed	No limit–but not more than 10% amber durum		2	No limit	2	5	No limit	No limit	5	5
Grade, if specs for CE Feed not met	50% or less amber durum–*Wheat, Sample CE Account Admixture*		*Wheat, Sample CE Account Stained Kernels*		*Wheat, Sample CE Account Fireburnt*	*Wheat, Sample CE Account Fusarium Damage*			*Wheat, Sample CE Account Heated*	*Wheat, Sample CE Account Heated*

					Smudge and blackpoint			
Grade name	**Natural stain %**	**Pink %**	**Sawfly, midge %**	**Shrunken and broken %**	**Penetrated smudge %**	**Total smudge %**	**Total %**	**Sprouted %**
No. 1 CEWW	0.5	3	2.0	3	3K	30K	10	1.0
No. 2 CEWW	2	6	8	5	0.5	1	15	5
No. 3 CEWW	5	10	15	8	1.0	3	35	8
CE Feed	No limit	No limit	No limit	No limit–maximum 50% broken	No limit	No limit	No limit	No limit
Grade, if specs for CE Feed not met				*Sample Broken Grain*				

K Number of kernel-sized pieces in 500 g

Wheat, Canada Eastern Soft White Spring (CESWS)

	Standard of quality			Foreign material					
Grade name	Minimum test weight kg/hL (g/0.5 L)	Variety	Degree of soundness	Ergot %	Excreta %	Matter other than cereal grains %	Sclerotinia %	Stones %	Total %
No. 1 CESWS	78 (380)	Any variety of the class CESWS designated as such by order of the Commission	Reasonably well matured, reasonably free from damaged kernels	0.01	0.01	0.2	0.01	0.03	1.0
No. 2 CESWS	74 (360)	Any variety of the class CESWS designated as such by order of the Commission	Fairly well matured, may be moderately weather-damaged, reasonably free from severely damaged kernels	0.02	0.01	0.3	0.02	0.03	2.0
No. 3 CESWS	69 (335)	Any variety of the class CESWS designated as such by order of the Commission	May be frost-damaged, immature or weather-damaged, moderately free from severely damaged kernels	0.04	**0.015**	0.5	0.04	0.03	3.0
CE Feed	65 (315)	Any class or variety of wheat excluding amber durum	Reasonably sweet, excluded from other grades of wheat on account of damaged kernels	0.1	0.03	1	**0.25**	0.1	10
Grade, if specs for CE Feed not met	*Wheat, Sample CE Account Light Weight*			*Wheat, Sample CE Account Ergot*	*Wheat, Sample CE Account Excreta*	*Wheat, Sample CE Account Admixture*	*Wheat, Sample CE Account Admixture*	2.5% or less– *Wheat, Sample CE Account Stones* Over 2.5%– *Wheat, Sample Salvage*	See *Mixed grain*

Wheat, Canada Eastern Soft White Spring (CESWS), continued

Grade name	Wheats of other classes or varieties %	Artificial stain, no residue %	Degermed %	Fireburnt %	Fusarium damage %	Grass green %	Grasshopper, army worm %	Heated	
								Binburnt, severely mildewedrotted, mouldy %	Total %
No. 1 CESWS	3	Nil	4	Nil	1.0	0.75	1	2K	0.1
No. 2 CESWS	6	3K	7	Nil	1.0	2	3	4K	0.25
No. 3 CESWS	10	7K	10	Nil	1.0	4	5	6K	0.75
CE Feed	No limit–but not more than 10% amber durum	2	No limit	2	5	No limit	No limit	5	5
Grade, if specs for CE Feed not met	50% or less–*Wheat, Sample CE Account Admixture*	*Wheat, Sample CE Account Stained Kernels*		*Wheat, Sample CE Account Fireburnt*	*Wheat, Sample CE Account Fusarium Damage*			*Wheat, Sample CE Account Heated*	*Wheat, Sample CE Account Heated*

Grade name	Natural stain %	Pink %	Sawfly, midge %	Shrunken and broken			Smudge and blackpoint			Sprouted %
				Shrunken %	Broken %	Total %	Penetrated smudge %	Total smudge %	Total %	
No. 1 CESWS	0.5	3	2.0	6	6	7	3K	30K	10	1.0
No. 2 CESWS	2	6	8	10	10	11	0.5	1	15	5
No. 3 CESWS	5	10	15	No limit	13	No limit within broken tolerances	1.0	3	35	8
CE Feed	No limit	No limit	No limit	No limit	50	No limit within broken tolerances	No limit	No limit	No limit	No limit
Grade, if specs for CE Feed not met					*Sample Broken Grain*					

Export shipments

Export shipments can be commercially clean or not commercially clean.

Commercially clean

Shipments are defined as commercially clean when meeting the commercially clean specifications listed in the export grade determinant table upon following the *Determination of commercially clean* procedures described in this chapter.

Dockage is not reported for commercially clean shipments.

Not commercially clean (NCC)

If any of the components exceed the allowable limits as defined in the tables, the shipment becomes *not commercially clean*, and dockage is assessed using procedures for primary samples.

Shipments, which do not meet the standards for commercial cleanliness, are referred to as not commercially clean. Such shipments are permitted only with the permission of the CGC.

For samples representing not commercially clean shipments approved by the CGC for shipment from terminal and transfer elevators, dockage is reported to the nearest

- 0.1% for samples representing commercially clean shipments loaded from a single terminal or transfer elevator
- 0.01% for composite samples representing shipments loaded from more than one terminal or transfer elevator

less a deduction of up to 0.2% to take into account the buildup of attritional material.

Grading

Wheat on export is graded using standard samples and export specifications. Where there are no export specifications, the primary specifications are used.

Export grade determinant tables

Wheat, Canada Western Red Spring (CWRS)

Column	1	Foreign Material						
		2	3	4	*5 (2+3+4)	6	7	*8 (2+6+7)
Grade name	Broken grain through #5 buckwheat sieve	Small seeds %	Attrition %	Roughage %	Total small seeds, attrition and roughage %	Large seeds %	Wild oats %	Total small seeds, large seeds and wild oats %
No. 1 CWRS	0.3	0.05	0.1	0.05	0.1	0.2	0.05	0.2
No. 2 CWRS	0.3	0.05	0.1	0.05	0.1	0.2	0.05	0.2
No. 3 CWRS	0.3	0.05	0.1	0.05	0.1	0.2	0.05	0.2
No. 4 CWRS	0.3	0.05	0.1	0.05	0.1	0.2	0.05	0.2
CW Feed	0.5	0.05	0.1	0.1	0.1	0.5	0.1	0.5

Column	Foreign Material					
	9	10	11	12	13	*14 (2+3+4+6+7 +9+10+11+12+13)
Grade name	Stones %	Mineral matter including stones %	Ergot %	Sclerotinia %	Other cereal grains and other matter %	Total foreign material %
No. 1 CWRS	0.03	0.06	0.01	0.01	0.4	0.4
No. 2 CWRS	0.03	0.10	0.02	0.02	0.75	0.75
No. 3 CWRS	0.06	0.10	0.04	0.04	1.25	1.25
No. 4 CWRS	0.06	0.10	0.04	0.04	2.4	2.4
CW Feed	0.1	0.25	0.1	0.1	5	5

* Columns which represent a subtotal of other columns show the columns to be added in parenthesis
The area inside dashed lines refers to factors which are assessed in determining commercial cleanliness.
Total foreign material does not include broken wheat passing through the #5 buckwheat sieve

Wheat, Canada Western Red Spring (CWRS) continued

Grade name	Minimum test weight kg/hL (g/0.5 L)	Wheats of other classes or varieties		Minimum hard vitreous kernels %	Sprouted		Heated		Shrunken and broken		
		Contrasting classes %	Total %		Severely sprouted %	Total %	Binburnt, severely mildewed, rotted, mouldy %	Total %	Shrunken %	Broken %	Total %
No. 1 CWRS	79.0 (385)	0.5	1.5	65	0.10	0.5	1 kernel per 1000 g	0.05	4	5	7
No. 2 CWRS	77.5 (378)	1.5	3	35	0.20	1.0	4 kernels per 1000 g	0.4	4	6	8
No. 3 CWRS	76.5 (373)	2.5	5	No minimum	0.30	3.0	6 kernels per 1000 g	1.0	4	7	9
No. 4 CWRS	75.0 (365)	2.5	5	No minimum	0.50	5	6 kernels per 1000 g	1.0	4	7	9
CW Feed	73.0 (355)	No limit–but not more than 10% amber durum		No minimum	No limit	No limit	2.5	2.5	4	13	15

Wheat, Canada Western Hard White Spring (CWHWS)

Column	1	Foreign Material						
		2	3	4	*5 (2+3+4)	6	7	*8 (2+6+7)
Grade name	Broken grain through #5 buckwheat sieve	Small seeds %	Attrition %	Roughage %	Total small seeds, attrition and roughage %	Large seeds %	Wild oats %	Total small seeds, large seeds and wild oats %
No. 1 CWHWS	0.3	0.05	0.1	0.05	0.1	0.2	0.05	0.2
No. 2 CWHWS	0.3	0.05	0.1	0.05	0.1	0.2	0.05	0.2
No. 3 CWHWS	0.3	0.05	0.1	0.05	0.1	0.2	0.05	0.2
No. 4 CWHWS	0.3	0.05	0.1	0.05	0.1	0.2	0.05	0.2
CW Feed	0.5	0.05	0.1	0.1	0.1	0.5	0.1	0.5

Column	Foreign Material					
	9	10	11	12	13	*14 (2+3+4+6+7 +9+10+11+12+13)
Grade name	Stones %	Mineral matter including stones %	Ergot %	Sclerotinia %	Other cereal grains and other matter %	Total foreign material %
No. 1 CWHWS	0.03	0.06	0.01	0.01	0.4	0.4
No. 2 CWHWS	0.03	0.10	0.02	0.02	0.75	0.75
No. 3 CWHWS	0.06	0.10	0.04	0.04	1.25	1.25
No. 4 CWHWS	0.06	0.10	0.04	0.04	2.4	2.4
CW Feed	0.1	0.25	0.1	0.1	5	5

* Columns which represent a subtotal of other columns show the columns to be added in parenthesis
The area inside dashed lines refers to factors which are assessed in determining commercial cleanliness.
Total foreign material does not include broken wheat passing through the #5 buckwheat sieve

Wheat, Canada Western Hard White Spring (CWHWS) continued

		Wheats of other classes or varieties		Sprouted		Heated		Shrunken and broken		
Grade name	Minimum test weight kg/hL (g/0.5 L)	Contrasting classes %	Total %	Severely sprouted %	Total %	Binburnt, severely mildewed, rotted, mouldy %	Total %	Shrunken %	Broken %	Total %
No. 1 CWHWS	79.0 (385)	0.5	1.5	0.10	0.5	1 kernel per 1000 g	0.05	4	5	7
No. 2 CWHWS	77.5 (378)	1.5	3	0.20	1.0	4 kernels per 1000 g	0.4	4	6	8
No. 3 CWHWS	76.5 (373)	2.5	5	0.30	3.0	6 kernels per 1000 g	1.0	4	7	9
No. 4 CWHWS	75.0 (365)	2.5	5	0.50	5	6 kernels per 1000 g	1.0	4	7	9
CW Feed	73.0 (355)	No limit–but not more than 10% amber durum		No limit	No limit	2.5	2.5	4	13	15

Wheat, Canada Western Amber Durum (CWAD)

Column	1	Foreign Material						
		2	3	4	*5 (2+3+4)	6	7	*8 (2+6+7)
Grade name	Broken grain through #5 buckwheat sieve	Small seeds %	Attrition %	Roughage %	Total small seeds, attrition and roughage %	Large seeds %	Wild oats %	Total small seeds, large seeds and wild oats %
No. 1 CWAD	0.3	0.05	0.1	0.05	0.1	0.2	0.10	0.2
No. 2 CWAD	0.3	0.05	0.1	0.05	0.1	0.2	0.15	0.2
No. 3 CWAD	0.3	0.05	0.1	0.05	0.1	0.2	0.15	0.2
No. 4 CWAD	0.5	0.05	0.1	0.05	0.1	0.2	0.15	0.2
No. 5 CWAD	0.5	0.05	0.1	0.1	0.1	0.5	0.15	1

Column	Foreign Material					
	9	10	11	12	13	*14 (2+3+4+6+7 +9+10+11+12+13)
Grade name	Stones %	Mineral matter including stones %	Ergot %	Sclerotinia %	Other cereal grains and other matter %	Total foreign material %
No. 1 CWAD	0.03	0.06	0.01	0.01	0.5	0.5
No. 2 CWAD	0.03	0.10	0.02	0.02	0.8	0.8
No. 3 CWAD	0.06	0.10	0.04	0.04	1.0	1.0
No. 4 CWAD	0.06	0.10	0.04	0.04	3.0	3.0
No. 5 CWAD	0.1	**0.25**	0.1	0.1	5	5

* Columns which represent a subtotal of other columns show the columns to be added in parenthesis
The area inside dashed lines refers to factors which are assessed in determining commercial cleanliness.
Total foreign material does not include broken wheat passing through the #5 buckwheat sieve

Wheat, Canada Western Amber Durum (CWAD) continued

Grade name	Minimum test weight kg/hL (g/0.5 L)	Wheats of other classes or varieties		Minimum hard vitreous kernels %	Sprouted		Heated		Shrunken and broken			Smudge and blackpoint			
												Smudge			
		Wheats of other classes %	Total %		Severely sprouted %	Total %	Binburnt, severely mildewed, rotted, mouldy %	Total %	Shrunken %	Broken %	Total %	Penetrated %	Red %	Total %	Total %
No. 1 CWAD	80.0 (392)	2.0	3	80	0.10	0.5	1 kernel per 1000 g	0.05	3	6	7	3K	30K	30K	5
No. 2 CWAD	79.5 (390)	2.5	5	60	0.20	2	2 kernels per 1000 g	0.1	3	8	9	**0.25**	1	1	10
No. 3 CWAD	78.0 (382)	**3.5**	7	40	8	8	4 kernels per 1000 g	0.4	3	10	11	0.5	1	3	20
No. 4 CWAD	75.0 (367)	10	15	No minimum	12	12	0.5	1.5	3	11	12	Consider overall appearance No limit			
No. 5 CWAD	No minimum	15	No limit	No minimum	No limit	No limit	5	5	3	13	15				

K Number of kernel-sized pieces in 500 g

Wheat, Canada Western Red Winter (CWRW)

		Foreign Material						
Column	1	2	3	4	*5 (2+3+4)	6	7	*8 (2+6+7)
Grade name	Broken grain through #5 buckwheat sieve	Small seeds %	Attrition %	Roughage %	Total small seeds, attrition and roughage %	Large seeds %	Wild oats %	Total small seeds, large seeds and wild oats %
No. 1 CWRW	0.3	0.05	0.1	0.05	0.1	0.2	0.1	0.2
No. 2 CWRW	0.3	0.05	0.1	0.05	0.1	0.2	0.1	0.2
CW Feed	0.5	0.05	0.1	0.1	0.1	0.5	0.1	0.5

	Foreign Material					
Column	9	10	11	12	13	*14 (2+3+4+6+7 +9+10+11+12+13)
Grade name	Stones %	Mineral matter including stones %	Ergot %	Sclerotinia %	Other cereal grains and other matter %	Total foreign material %
No. 1 CWRW	0.03	0.06	0.01	0.01	1.0	1.0
No. 2 CWRW	0.06	0.10	0.04	0.04	2.0	2.0
CW Feed	0.1	0.25	0.1	0.1	5	5

* Columns which represent a subtotal of other columns show the columns to be added in parenthesis
The area inside dashed lines refers to factors which are assessed in determining commercial cleanliness.
Total foreign material does not include broken wheat passing through the #5 buckwheat sieve

Wheat, Canada Western Red Winter (CWRW) continued

Grade name	Minimum test weight kg/hL (g/0.5 L)	Wheats of other classes or varieties		Minimum hard vitreous kernels %	Sprouted		Heated		Shrunken and broken		
		Contrasting classes %	Total %		Severely sprouted %	Total %	Binburnt, severely mildewed, rotted, mouldy %	Total %	Shrunken %	Broken %	Total %
No. 1 CWRW	78.0 (380)	1.0	3	50	0.1	0.5	1 kernel per 1000 g	0.05	3	5	7
No. 2 CWRW	74.0 (360)	2.5	6	No minimum	0.3	2.5	2 kernels per 1000 g	0.1	3	7	9
CW Feed	73.0 (355)	No limit–but not more than 10% amber durum		No minimum	No limit	No limit	2.5	2.5	4	13	15

Wheat, Canada Western Soft White Spring (CWSWS)

Column	1	Foreign Material						
		2	3	4	*5 (2+3+4)	6	7	*8 (2+6+7)
Grade name	Broken grain through #5 buckwheat sieve	Small seeds %	Attrition %	Roughage %	Total small seeds, attrition and roughage %	Large seeds %	Wild oats %	Total small seeds, large seeds and wild oats %
No. 1 CWSWS	0.3	0.05	0.1	0.05	0.1	0.2	0.05	0.2
No. 2 CWSWS	0.3	0.05	0.1	0.05	0.1	0.2	0.05	0.2
No. 3 CWSWS	0.3	0.05	0.1	0.05	0.1	0.2	0.05	0.2
CW Feed	0.5	0.05	0.1	0.1	0.1	0.5	0.1	0.5

Column	Foreign Material					
	9	10	11	12	13	*14 (2+3+4+6+7 +9+10+11+12+13)
Grade name	Stones %	Mineral matter including stones %	Ergot %	Sclerotinia %	Other cereal grains and other matter %	Total foreign material %
No. 1 CWSWS	0.03	0.06	0.01	0.01	0.75	0.75
No. 2 CWSWS	0.03	0.10	0.02	0.02	1.0	1.0
No. 3 CWSWS	0.06	0.10	0.04	0.04	1.5	1.5
CW Feed	0.1	0.25	0.1	0.1	5	5

* Columns which represent a subtotal of other columns show the columns to be added in parenthesis
The area inside dashed lines refers to factors which are assessed in determining commercial cleanliness.
Total foreign material does not include broken wheat passing through the #5 buckwheat sieve

Wheat, Canada Western Soft White Spring (CWSWS) continued

			Sprouted		Heated		Shrunken and broken			Smudge and blackpoint		
										Smudge		
Grade name	**Minimum test weight kg/hL (g/0.5 L)**	**Wheats of other classes or varieties %**	**Severely sprouted %**	**Total %**	**Binburnt, severely mildewed, rotted, mouldy %**	**Total %**	**Shrunken %**	**Broken %**	**Total %**	**Penetrated %**	**Total %**	**Total %**
No. 1 CWSWS	78.0 (380)	1.5	0.10	1	1 kernel per 1000 g	0.05	3	5	7	3K	30K	10
No. 2 CWSWS	75.5 (368)	3	0.30	5	2 kernels per 1000 g	0.1	3	6	8	0.5	1	15
No. 3 CWSWS	75.0 (365)	5	0.50	8	4 kernels per 1000 g	0.4	3	7	9	1.0	3	35
CW Feed	73.0 (355)	No limit–but not more than 10% amber durum	No limit	No limit	2.5	2.5	4	13	15	No limit	No limit	No limit

K Number of kernel-sized pieces in 500 g

Wheat, Canada Western Extra Strong (CWES)

Column	1	Foreign Material						
		2	3	4	*5 (2+3+4)	6	7	*8 (2+6+7)
Grade name	Broken grain through #5 buckwheat sieve	Small seeds %	Attrition %	Roughage %	Total small seeds, attrition and roughage %	Large seeds %	Wild oats %	Total small seeds, large seeds and wild oats %
No. 1 CWES	0.3	0.05	0.1	0.05	0.1	0.2	0.10	0.2
No. 2 CWES	0.3	0.05	0.1	0.05	0.1	0.2	0.10	0.2
CW Feed	0.5	0.05	0.1	0.1	0.1	0.5	0.1	0.5

Column	Foreign Material					
	9	10	11	12	13	*14 (2+3+4+6+7 +9+10+11+12+13)
Grade name	Stones %	Mineral matter including stones %	Ergot %	Sclerotinia %	Other cereal grains and other matter %	Total foreign material %
No. 1 CWES	0.03	0.10	0.03	0.03	0.75	0.75
No. 2 CWES	0.06	0.10	0.06	0.06	1.5	1.5
CW Feed	0.1	0.25	0.1	0.1	5	5

* Columns which represent a subtotal of other columns show the columns to be added in parenthesis
The area inside dashed lines refers to factors which are assessed in determining commercial cleanliness.
Total foreign material does not include broken wheat passing through the #5 buckwheat sieve

Wheat, Canada Western Extra Strong (CWES) continued

Grade name	Minimum test weight kg/hL (g/0.5 L)	Wheats of other classes or varieties		Sprouted		Heated		Shrunken and broken		
		Contrasting classes %	Total %	Severely sprouted %	Total %	Binburnt, severely mildewed, rotted, mouldy %	Total %	Shrunken %	Broken %	Total %
No. 1 CWES	78.0 (380	1.5	3	0.10	0.5	1 kernel per 1000 g	0.4	3.	7	8
No. 2 CWES	76.0 (370)	2.5	5	0.30	2	2 kernels per 1000 g	1.0	3	7	8
CW Feed	73.0 (355)	No limit–but not more than 10% amber durum		No limit	No limit	2.5	2.5	4	13	15

Wheat, Canada Prairie Spring Red (CPSR)

Column	1	Foreign Material						
		2	3	4	*5 (2+3+4)	6	7	*8 (2+6+7)
Grade name	Broken grain through #5 buckwheat sieve	Small seeds %	Attrition %	Roughage %	Total small seeds, attrition and roughage %	Large seeds %	Wild oats %	Total small seeds, large seeds and wild oats %
No. 1 CPSR	0.3	0.05	0.1	0.05	0.1	0.2	0.10	0.2
No. 2 CPSR	0.3	0.05	0.1	0.05	0.1	0.2	0.10	0.2
CW Feed	0.5	0.05	0.1	0.1	0.1	0.5	0.1	0.5

Column	Foreign Material					
	9	10	11	12	13	*14 (2+3+4+6+7 +9+10+11+12+13)
Grade name	Stones %	Mineral matter including stones %	Ergot %	Sclerotinia %	Other cereal grains and other matter %	Total foreign material %
No. 1 CPSR	0.03	0.10	0.03	0.03	0.75	0.75
No. 2 CPSR	0.03	0.10	0.06	0.06	1.5	1.5
CW Feed	0.1	0.25	0.1	0.1	5	5

* Columns which represent a subtotal of other columns show the columns to be added in parenthesis
The area inside dashed lines refers to factors which are assessed in determining commercial cleanliness.
Total foreign material does not include broken wheat passing through the #5 buckwheat sieve

Wheat, Canada Prairie Spring Red (CPSR) continued

		Wheats of other classes or varieties		Sprouted		Heated		Shrunken and broken		
Grade name	Minimum test weight kg/hL (g/0.5 L)	Contrasting classes %	Total %	Severely sprouted %	Total %	Binburnt, severely mildewed, rotted, mouldy %	Total %	Shrunken %	Broken %	Total %
No. 1 CPSR	77.0 (375)	3	5	0.10	0.5	4 kernels per 1000 g	0.4	5	6	9
No. 2 CPSR	75.0 (365)	5	10	0.30	2	6 kernels per 1000 g	1.0	5	6	9
CW Feed	73.0 (355)	No limit–but not more than 10% amber durum		No limit	No limit	**2.5**	**2.5**	4	13	15

Wheat, Canada Prairie Spring White (CPSW)

Column	1	Foreign Material						
		2	3	4	*5 (2+3+4)	6	7	*8 (2+6+7)
Grade name	Broken grain through #5 buckwheat sieve	Small seeds %	Attrition %	Roughage %	Total small seeds, attrition and roughage %	Large seeds %	Wild oats %	Total small seeds, large seeds and wild oats %
No. 1 CPSW	0.3	0.05	0.1	0.05	0.1	0.2	0.10	0.2
No. 2 CPSW	0.3	0.05	0.1	0.05	0.1	0.2	0.10	0.2
CW Feed	0.5	0.05	0.1	0.1	0.1	0.5	0.1	0.5

Column	Foreign Material					
	9	10	11	12	13	*14 (2+3+4+6+7 +9+10+11+12+13)
Grade name	Stones %	Mineral matter including stones %	Ergot %	Sclerotinia %	Other cereal grains and other matter %	Total foreign material %
No. 1 CPSW	0.03	0.10	0.03	0.03	0.75	0.75
No. 2 CPSW	0.03	0.10	0.06	0.06	1.5	1.5
CW Feed	0.1	0.25	0.1	0.1	5	5

* Columns which represent a subtotal of other columns show the columns to be added in parenthesis
The area inside dashed lines refers to factors which are assessed in determining commercial cleanliness.
Total foreign material does not include broken wheat passing through the #5 buckwheat sieve

Wheat, Canada Prairie Spring White (CPSW) continued

Grade name	Minimum test weight kg/hL (g/0.5 L)	Wheats of other classes or varieties		Sprouted		Heated		Shrunken and broken		
		Contrasting classes %	Total %	Severely sprouted %	Total %	Binburnt, severely mildewed, rotted, mouldy %	Total %	Shrunken %	Broken %	Total %
No. 1 CPSW	77.0 (375)	3	5	0.10	0.5	4 kernels per 1000 g	0.4	5	6	9
No. 2 CPSW	75.0 (365)	5	10	0.30	2	6 kernels per 1000 g	1.0	5	6	9
CW Feed	73.0 (355)	No limit–but not more than 10% amber durum		No limit	No limit	2.5	2.5	4	13	15

5. Rye

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Determination of commercially clean

Dockage is not assessed on rye sample that meet the commercially clean specifications defined in the rye export grade determinant table. All samples must be analyzed to determine if they are commercially clean prior to dockage assessment. The analysis of samples which are **clearly** not commercially clean may consist of a visual assessment. For example, if there is no doubt that a sample contains more than 0.05% of small seeds without hand sieving and weighing the seeds then dockage will be assessed using procedures defined under *Determination of dockage.* Where there is any doubt regarding whether the sample is commercially clean the sample must be analyzed using the procedures outlined in steps 1 through 5 below to confirm that the sample is not commercially clean prior to assessing a dockage.

1. Using a Boerner-type divider, divide the sample to obtain a representative portion.
    - Official samples should be at least 900 grams.
    - Unofficial samples should be at least 750 grams.
2. Place approximately 250 grams of the sample at a time on the No. 4.5 round hole hand sieve.
3. Move the sieves from left to right 30 times using a sifting motion. One complete motion is approximately 10 cm from the center to one side, back to the center, approximately 10 cm to the other side and back to the center.
4. All material passing through the No. 4.5 round hole sieve is weighed and the percentage calculated to determine if it meets the commercially clean specification of the grade for material removable through the No. 4.5 round hole sieve. (Column #2 in the rye export grade determinant table)
5. Small seeds passing through the No. 4.5 round hole sieve are weighed and the percentage calculated to determine if they meet the commercially clean specification of the grade for small seeds. (Column #1 in the rye export grade determinant table)

Should the percentage concentration of either of the factors determined in steps 1 through 5 exceed the specifications set out in columns 1 or 2 of the rye export grade determinant chart the sample will be considered to be not commercial clean. Dockage will be assessed on samples determined to be not commercially clean by using the procedures defined under *Determination of dockage.*

Determination of dockage

Definitions

Dockage is assessed and recorded to the nearest 0.1%.

Dockage is defined under the Canada Grain Act as "any material intermixed with a parcel of grain, other than kernels of grain of a standard of quality fixed by or under this Act for a grade of that grain, that must and can be separated from the parcel of grain before that grade can be assigned to the grain." Dockage is removed by following the cleaning procedures described in this chapter.

The sample as it arrives is referred to as the uncleaned or dirty sample. Its weight is the **gross weight** of the sample. Dockage is assessed on the gross weight of the sample.

Dockage is assessed in two stages.

1. Follow *Normal cleaning procedures,* using the Carter dockage tester.
2. Follow procedures for *Cleaning for grade improvement.* This cleaning can be done at any time after normal cleaning has been completed.

Dockage not reported

▲ **Important:** Dockage is not reported for samples grading

- *Rye, Sample CW/CE Account Fireburnt*
- *Rye, Sample Salvage*
- *Rye, Sample Condemned*

Normal cleaning procedures

▲ **Important:** Wear gloves and a mask to handle any samples that you suspect may contain hazardous substances.

1. Set up the Carter dockage tester as follows:

Feed control	#5
Air control	Minimum #4
Riddle	No. 25 or No. 1
Top sieve	No. 6 buckwheat
Centre sieve	No. 5 buckwheat
Bottom sieve	No 5 buckwheat
Sieve cleaner control	Off

2. Using a Boerner-type divider, divide the uncleaned sample to obtain a representative portion.
   - Official samples should be at least 900 grams.
   - Unofficial samples should be at least 750 grams.
3. Turn on the Carter dockage tester.

4. Pour the sample into the hopper.
5. After the sample has passed through the machine, turn on the sieve cleaner control for two to three seconds to remove kernels lodged in the sieve.
6. Turn off the dockage tester.
7. Lightly snap the retainer rod of the aspiration pan to loosen material gathered on the air screen.
8. Remove the aspiration pan.
9. Handpick large whole kernels of rye from the portion passing over the riddle and return them to the cleaned sample.
10. Determine dockage. Use the list under *Composition of dockage.*

Composition of dockage

Dockage includes

- Rye with long rootlets removed by the riddle.
- For samples of rye which are graded *Rye Sample CW/CE Account Sprouted* any rye with long rootlets that was removed by the riddle will be returned to the sample and not assessed as dockage (See *Sprouted)*
- Material other than rye removed by the No. 25 riddle
- Material removed by aspiration
- Material that passes through the bottom No. 5 buckwheat Carter sieve
- A maximum of 10% soft earth pellets handpicked from the clean sample
- Material removed by *Cleaning for grade improvement*

Cleaning for grade improvement

If the grade of a sample can be improved by additional cleaning, perform the cleaning and add the additional material to dockage. Cleaning for grade improvement can be done at any time after normal cleaning.

Procedures are summarized in the table which follows.

1. Sieve the sample using the No. 6 buckwheat hand sieve.

   ▲ **Important:** When you use a hand sieve, move the sieve from left to right 30 times, using a sifting motion. One time is one complete motion from the centre, to one side, to the other side, and back to the centre. The total distance from left to right is 20 cm, about eight inches.

2. Weigh the additional dockage and add it to the original dockage.

Cleaning for grade improvement—Rye

Material to be removed	Equipment	Effect on composition of dockage
Broken kernels	No. 6 buckwheat hand sieve	If the weight of broken kernels is over the grade tolerance but is • Less than 5% of the gross weight, add to dockage • 5% or more of the gross weight, broken kernels become a grading factor. Return them to the cleaned sample. See *Broken kernels*

Optional analysis

Where a shipper requests special cleaning of a carlot of grain at a terminal or transfer elevator, and the elevator manager agrees, dockage material will be analyzed for the presence of grain. The percentage and grade of any grain contained in the dockage will be reported and elevator stocks will be adjusted on the basis of the analysis.

Agreement of the shipper and unload elevator must be conveyed to the CGC in writing prior to the analysis being performed.

Procedures

1. Analyze the official sample.
2. Record the following on inspection records:
   - The percentage by gross weight to the nearest 0.1% and the grade of rye.
   - The percentage by gross weight to the nearest 0.1% and the grade of grain separable from dockage.
   - The percentage of dockage.

Example
95.0% Rye, No. 1 CW
4. 0% Domestic Mustard Seed, No. 1 CAN Oriental
1.0% dockage

Grading

Important definitions

Net weight of sample

The sample after cleaning and removal of dockage is referred to as the cleaned sample. Its weight is the net weight of the sample. Percentages by weight for grading refer to percentages of the cleaned sample, or the net weight.

Kernel counts (K)

The kernel count is the number of kernel-sized pieces in 500 gram sample.

- To do kernel counts, you must have 500 grams of cleaned sample.
- All grading is done on representative portions divided down from the cleaned sample using a Boerner-type divider.

Hazardous substances in samples

Wear gloves and a mask to handle any samples that you suspect may contain hazardous substances. Hazardous substances are defined in the Regulations as "any pesticide, herbicide or desiccant."

Representative portion for grading

All grading is done on representative portions divided down from the cleaned sample, using a Boerner-type divider.

When concentration of the grading factor is ...	Then use ...
Low	Optimum portion size
High	Minimum portion size or more **(do not use less)**

Values in this table represent a range of recommended portion sizes.

Representative portion of rye for grading, grams

Grading factor	Minimum	Optimum	Export
Broken	50	**100**	100
Ergot	500	**1000**	1000
Excreta	working sample	**working sample**	working sample
Fireburnt	500	**working sample**	working sample
Fusarium damage	10	**100**	100
Heated	50	**100**	100
Matter other than cereal grains	50	**100**	250
Odour	working sample	**working sample**	working sample
Other cereal grains, excluding wheat	50	**100**	250
Sclerotinia sclerotiorum	500	**1000**	1000
Smudge	working sample	**working sample**	working sample
Soft earth pellets	working sample	**working sample**	working sample
Sprouted	10	**50**	50
Stones	250	**1000**	1000
Wheat	50	**100**	250

Grading factors

Broken (BKN)

Broken kernels are pieces of rye that are less than three-quarters of a whole kernel.

- If the broken kernel has been chewed by insects, it is also considered as broken for grading purposes as long as no mould is evident on the exposed endosperm.
- If the broken kernel has mould on exposed endosperm, it is graded relative to the degree of soundness.

Representative portion for analysis

Minimum—50 g Optimum—100 g Export—100 g

Procedures

- In samples graded *Rye, Sample CW/CE Account Broken* or *Rye, Sample Broken Grain,* handpick any broken rye removed in cleaning but remaining on top of the No. 4.5 round-hole hand sieve. Return it to the cleaned sample.
- For reporting and grading, round down the percentage by weight of broken rye in the cleaned sample to a whole number; for example, 4.9% becomes 4%.

Contaminated grain

▲ **Important:** Wear gloves and a mask to handle any sample that is suspected of containing contaminated grain.

Contaminated is defined in the "*Canada Grain Act*" as; "Contaminated means, in respect of grain, containing any substance in sufficient quantity that the grain is unfit for consumption by persons or animals or is adulterated within the meaning of the regulations made pursuant to sections B.01.046(1), B.15.001 and B.15.002(1) of the Food and Drugs Act."

Determination as to whether grain is contaminated will be made by the Grain Research Laboratory in consultation with the Chief Grain Inspector for Canada. Samples deemed to be contaminated are graded *Rye, Sample Condemned.*

Degermed kernels (DGM)

Degermed kernels

- Are considered *Sprouted* if the sample contains other sprouted kernels
- Are considered sound if the sample contains no other sprouted kernels

Earth pellets (EP)

- Hard earth pellets are pellets that do not crumble under light pressure. See *Stones.*
- Soft earth pellets are pellets that crumble under light pressure. See *Soft earth pellets.*

Ergot (ERG)

Ergot is a plant disease producing elongated fungal bodies that have a purplish-black exterior, a purplish-white to off white interior, and a relatively smooth surface texture.

Representative portion for analysis

Minimum—500 g
Optimum—1000 g
Export—1000 g

Procedures

- Determine the weight of ergot as a percentage of the net weight of the sample.

Excreta (EXCR)

▲ **Important:** Wear gloves and a mask to handle any samples that you suspect may contain excreta.

Representative portion for analysis

Minimum—working sample
Optimum—working sample
Export—working sample

Fertilizer pellets (FERT PLTS)

Fertilizer pellets are typically either small, round and white or irregular shaped and pink or red. Fertilizer pellets are not considered a hazardous substance however there is no visible means of assuring that material resembling fertilizer pellets is not some other contaminant.

Representative portion for analysis

Minimum—working sample
Optimum—working sample
Export—working sample

Procedures

- Handpick any fertilizer pellets and determine the concentration basis the net working sample.
- Fertilizer pellets are assessed as stones when the concentration does not exceed 1.0% of the net sample weight.
- Samples containing fertilizer pellets in excess of 1.0% of the net sample weight are graded *Rye, Held IP Suspect Contaminated Grain.*

Note: Canadian Grain Commission personnel should refer to ISO national work instruction "*Suspect Contaminated Grain, Handling Procedures*" for procedures to be followed when handling samples containing fertilizer pellets.

Fireburnt kernels (FBNT)

Fireburnt kernels are charred or scorched by fire. A cross-section of a fireburnt kernel resembles charcoal with numerous air holes. The air holes result in a low-weight kernel which crumbles easily under pressure.

Representative portion for analysis

Minimum—500 g

Optimum—working sample

Export—working sample

Foreign material (FM)

Foreign material in rye includes all material other than whole or broken rye that remains in the sample after the removal of dockage.

Fusarium damage (FUS DMG)

Fusarium-damaged kernels in rye are chalk-like in appearance and frequently have a fibrous growth in the kernel crease. Rye has a shallow crease and therefore the fibrous growth is frequently removed during handling.

Representative portion for analysis

Minimum—10 g

Optimum—100 g

Export—100 g

Procedures

Separate all kernels showing any evidence of fusarium damage, including any kernels that have a chalk-like appearance. Apply the following guidelines.

Fusarium-damaged kernels includes

- Chalk-like kernels in combination with a fibrous mould
- Chalk-like kernels without the fibrous mould if the mould is present on other chalk-like kernels in the sample

Do not include

- Chalk-like kernels without the fibrous mould if there are no other chalk-like kernels with mould in the sample

Heated kernels (HTD)

Heated kernels are red or orange, and have the odour typical of grain that has deteriorated in storage or has been damaged by artificial drying. Heated rye is not easily detected because of the natural colour variations that occur in sound rye.

Rotted kernels are included in the tolerance for *Heated*.

Representative portion for analysis

Minimum—50 g

Optimum—100 g

Export—100 g

Matter other than cereal grains (MOTCG)

Matter other than cereal grains includes the following material remaining in the cleaned sample:

- Seeds such as ragweed, Tartary buckwheat, rye grass, wild oats
- Non-cereal domestic grains such as flaxseed, corn, peas, buckwheat or lentils

Representative portion for analysis

Minimum—50 g	Optimum—100 g	Export—250 g

Odour (ODOR)

There is no numeric tolerance for odour. Consider

- The basic quality of the sample
- The type and degree of the odour
- The presence of visible residue causing the odour

Representative portion for analysis

Minimum—working sample	Optimum—working sample	Export—working sample

If odour is the grade determinant and there is ...	Then the grade is...
A distinct objectionable odour not associated with the quality of the grain, but not heated or fireburnt	*Rye, Sample CW/CE Account Odour*
A distinct heated odour	*Rye, Sample CW/CE Account Heated*
A distinct fireburnt odour	*Rye, Sample CW/CE Account Fireburnt*

Other cereal grains excluding wheat (OCGXWHT)

Other cereal grains, excluding wheat in rye are barley, triticale, oats and groats, including wild oat groats. For oats, see *Machine separation*. For wheat, see *Wheat*.

Representative portion for analysis

Minimum—50 g	Optimum—100 g	Export—250 g

Rotted (ROT)

See Heated.

Sclerotinia sclerotiorum (SCL)

Sclerotinia sclerotiorum is a fungus producing hard masses of fungal tissue, called *sclerotia*. The sclerotia vary in size and shape, have a course surface texture, vary in exterior color from dark black to gray to white and have a pure white interior.

Representative portion for analysis

Minimum—500 g
Optimum—1000 g
Export—1000 g

Smudge (SM)

Smudge describes the discolouration caused by disease. The dark kernels often found in rye are similar in appearance to wheat kernels which has been affected by blackpoint or smudge.

Representative portion for analysis

Minimum—working sample
Optimum—working sample
Export—working sample

Procedures

When grading, consider the incidence and severity of the discolouration. There is no specific numeric tolerance. This factor is considered under *Degree of soundness,* as defined in the Primary Grade Determinants tables.

Soft earth pellets (SEP)

Soft earth pellets are

- Earth pellets that crumble into fine dust under light pressure, using a finger only—if they do not crumble, they are considered *Stones*
- Any non-toxic material of similar consistency

Representative portion for analysis

Minimum—working sample
Optimum—working sample
Export—working sample

Procedures

1. Handpick soft earth pellets from a representative portion of the cleaned sample.
2. Soft earth pellets constituting 10.0% or less of the sample are assessed as dockage.
3. Where soft earth pellets represent more than 10% of the net weight, the sample is graded *Rye, Sample CW/CE Account Admixture.*

Sprouted kernels (SPTD)

Sprouted kernels show definite signs of germination.

▲ **Important**: Kernels with long rootlets which clean out over the No. 25 or No. 1 riddle are either

- Included in dockage, as described in *Composition of dockage*
- Returned to the sample and become a grading factor, in samples graded *Rye, Sample CW/CE, Account Sprouted*

Representative portion for analysis

Minimum—10 g	Optimum—50 g	Export—50 g

Stones (STNS)

Stones are hard shale, coal, hard earth pellets, and any other non toxic materials of similar consistency. Fertilizer pellets are assessed as stones when constituting 1.0% or less of the net sample weight. (See *Fertilizer pellets* for specific procedures to be followed when samples contain fertilizer pellets.)

Representative portion for analysis

Minimum—500 g	Optimum—1000 g	Export—1000 g

Procedures

1. Handpick stones from a representative portion of the cleaned sample.
2. Determine stone concentration in the net sample.

- In western Canada samples of grain containing stones in excess of "basic grade" tolerances, up to 2.5% are graded *Rye, Rejected "basic grade" Account Stones*. The "*basic grade*" refers to a grade established in the Canada Grain Regulations (grades listed in the first column in grade determinant tables) that would have been assigned to the sample if it contained no stones.
- In eastern Canada samples of grain containing stones in excess of grade tolerances are degraded to lower grades. Samples containing stones in excess of the tolerance of the lowest grade established by regulation up to 2.5% are graded *Rye, Sample Canada Eastern/Can Account Stones.*
- In western and eastern Canada grain containing more than 2.5% stones is graded *Rye, Sample Salvage.*

Examples: Western Canada

Excerpt from grade determinant tables for

Rye, Canada Western

Grade name	Stones %
No. 1 CW	0.033
No. 2 CW	0.033
No. 3 CW	0.066

Basic grade:.......................... *Rye, No. 2 CW*
Reason for basic grade:....... Mildew

If the above sample contained	Grade in western Canada
0.05% stones	*Rye, Rejected No. 2 CW Account Stones*
1.0% stones	*Rye, Rejected No. 2 CW Account Stones*
3.0% stones	*Rye, Sample Salvage*

Examples: Eastern Canada

Excerpt from grade determinant tables for

Rye, Canada Eastern

Grade name	Stones
No. 1 CE	3K
No. 2 CE	3K
No. 3 CE	5K

K Number of kernel-sized pieces in 500 g

Basic grade:.......................... *Rye, No. 2 CE*
Reason for basic grade:....... Mildew

If the above sample contained	Grade in eastern Canada
4K stones	*Rye, No. 3 CE*
10K stones	*Rye, Sample CE Account Stones*
3.0% stones	*Rye, Sample Salvage*

Treated seed and other chemical substances

Treated seed

Treated seed is grain that has been coated with an agricultural chemical for agronomic purposes. These seed dressings contain a dye to render the treated seed visually conspicuous. The colour of the dye varies depending upon the type of treatment and the type of grain. The current Canadian colour standards for pesticide seed treatments are: cereals–pink or red, canola–baby blue or green. Seed treated with an inoculant may have a green stain. The coatings or stains may appear greasy or powdery and surface area distribution ranges from tiny flecks to complete coverage.

Other chemical substances

Other chemical substances refers to any chemical residues either adhering to the kernel or remaining in the sample and to samples having a chemical odour of any kind.

▲ **Important:** Wear gloves and a mask to handle any samples that you suspect may contain contaminated grain.

Representative portion for analysis

Minimum—working sample
Optimum—working sample
Export—working sample

If a sample is suspected of being coated with a pesticide, desiccant, inoculant or if the sample contains evidence of any foreign chemical substance other than fertilizer pellets, the sample shall be graded *Rye, Held IP Suspect Contaminated Grain*.

Note: Canadian Grain Commission personnel should refer to ISO national work instruction "*Suspect Contaminated Grain, Handling Procedures*" for specific procedures to be followed when handling samples suspected of containing treated seed or other chemical substances

Varieties

Rye is graded without reference to variety.

Wheat (WHT)

Wheat is considered foreign material in rye.

Representative portion for analysis

Minimum—50 g
Optimum—100 g
Export—250 g

Primary grade determinants tables

Rye, Canada Western/Canada Eastern (CW/CE)

	Standard of quality		Damage				
Grade name	Minimum test weight kg/hL (g/0.5 L)	Degree of soundness	Broken %	Fireburnt %	Fusarium %	Heated %	Sprouted %
No. 1 CW/CE	72 (349)	Well matured, practically free from weather-damaged kernels	4	Nil	0.25	0.1	0.5
No. 2 CW/CE	69 (334)	Reasonably well matured, reasonably free from weather-damaged kernels	5	Nil	0.5	0.75	2
No. 3 CW/CE	63 (304)	Excluded from higher grades on account of damaged kernels	8	Nil	1	5	10
Grade, when No. 3 specs not met	*Rye, Sample CW/CE Account Light Weight*		50% or less-*Rye, Sample CW/CE Account Broken Grain* Over 50%-*Sample Broken Grain*	*Rye, Sample CW/CE Account Fireburnt*	*Rye, Sample CW/CE Account Fusarium Damage*	*Rye, Sample CW/CE Account Heated*	*Rye, Sample CW/CE Account Sprouted*

	Foreign material							
						Stones %		
Grade name	Cereal grains other than wheat %	Ergot %	Excreta %	Matter other than cereal grains %	Sclerotinia %	CW	CE	Total %
No. 1 CW/CE	1.5	0.05	0.01	0.5	0.05	0.033	3K	2
No. 2 CW/CE	3	0.20	0.01	1	0.10	0.033	3K	5
No. 3 CW/CE	10	0.33	0.02	2	0.25	0.066	5K	10
Grade, when No. 3 specs not met	See *Mixed grain*	*Rye, Sample CW/CE Account Ergot*	*Rye, Sample CW/CE Account Excreta*	*Rye, Sample CW/CE Account Admixture*	*Rye, Sample CW/CE Account Admixture*	2.5% or less-*Rye, Rejected (grade) Account Stones* Over 2.5%-*Rye, Sample Salvage*	2.5% or less-*Rye, Sample CE Account Stones* Over 2.5%-*Rye, Sample Salvage*	See *Mixed grain*

Export shipments

Export shipments can be commercially clean or not commercially clean.

Commercially clean

Shipments are defined as commercially clean when meeting the commercially clean specifications listed in the export grade determinant table upon following the *Determination of commercially clean* procedures described in this chapter.

No dockage is reported for samples representing commercially clean rye.

Not commercially clean (NCC)

Shipments that do not meet the standards for commercial cleanliness are referred to as not commercially clean. Such shipments are permitted only with the permission of the CGC.

For samples representing not commercially clean shipments approved by the CGC for shipment from terminal and transfer elevators, dockage is reported to the nearest
- 0.1% for samples representing commercially clean shipments loaded from a single terminal or transfer elevator
- 0.01% for composite samples representing shipments loaded from more than one terminal or transfer elevator

less a deduction of up to 0.2% to take into account the buildup of attritional material.

Grading

Rye on export is graded using standard samples and export specifications. Where there are no export specifications, the primary specifications are used.

Export grade determinants tables

Rye, Canada Western (CW)

	Removable material through 4.5 round-hole sieve		Foreign material										
								Mineral matter					
Grade name	(1) Small seeds %	(2) Total %	Large seeds %	Wild oats %	Total %	Cereal grains other than wheat %	Ergot %	Stones %	Total mineral matter %	Sclerotinia %	Total foreign material, including wheat %	Heated %	Sprouted %
No. 1 CW	0.05	0.10	0.10	0.10	0.15	1.5	0.05	**0.033**	**0.066**	0.05	2	0.05	0.5
No. 2 CW	0.05	0.10	0.15	0.10	0.20	3	0.20	**0.033**	0.10	0.10	5	**0.35**	2
No. 3 CW	0.05	0.10	**0.25**	**0.15**	**0.25**	10	**0.33**	**0.066**	**0.15**	**0.25**	10	2	10

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Classes, types and varieties

Classes

Barley is divided into three classes based on end use, malting, hulless and general purpose.

Malting

Malting barley is a dual purpose barley. If production cannot be sold at a premium for malting and brewing, then it is used for livestock feed. Only about 20 percent of malting barley production is actually *selected* for malting each year. The other 80 percent is used domestically as livestock feed or exported as feed barley. Registered feed barley is not suitable for malting and brewing, and can be used only for livestock feed.

There are three malting grades, *Special Select, Select*, and *Standard*. Barley selected for malting that does not qualify for one of these grades is graded *Barley, Sample Select CW/CE, Two-row/Six-row Account "Factor"*.

Hulless

Hulless barley is used primarily for animal feed, mostly for swine, but it is also marketed for human consumption. Hulless varieties have a very loose hull which is usually removed during harvesting.

There are two hulless grades, *Select* and *Standard*. Hulless barley *not selected* may be assigned only to the *Standard* or general purpose grades.

General purpose

General purpose grades include barley not selected for malting and hulless barley not qualifying for *Standard CW/CE Hulless*.

Types

Two-row barley

A head of two-row barley contains two rows of kernels along its length.

Six-row barley

A head of six-row barley contain six rows of kernels along its length, in two groups of three kernels each.

Barley of other types

In two-row barley, barley of other types is any six-row variety. In six-row barley, barley of other types is any two-row variety.

Determination of commercially clean

All samples must be analyzed to determine if they are commercially clean prior to dockage assessment. The analysis of samples, that are **clearly** not commercially clean, may consist of a visual assessment. For example, if there is no doubt that a sample contains more than 0.1% of small seeds without passing the sample over the Carter dockage tester as set up below and weighing the small seeds, then primary dockage assessment procedures can be followed. Where there is any doubt regarding whether the sample is commercially clean, the sample must be analysed using the procedures outlined in steps 1 through 4 below to confirm that the sample is not commercially clean prior to assessing a dockage.

1. Using a Boerner-type divider, divide the sample to obtain a representative portion.
   - Official samples should be at least 900 grams.
   - Unofficial samples must be at least 750 grams.
2. Pass the sample over the Carter dockage tester set up as follows:

Feed control	5
Air control	3
Riddle	None
Top sieve	No. 4.5 round-hole
Centre sieve	Blank tray
Bottom sieve	None
Sieve cleaner control	Off

3. Small seeds passing through the No. 4.5 round-hole sieve are weighed and the percentage calculated to determine if they meet the commercially clean specification of the grade for small seeds. (Column #1 in the Barley Export grade determinant table)
4. All material passing through the No. 4.5 round-hole sieve is combined with dust and chaff removed by aspiration and the percentage calculated to determine if they meet the commercially clean specification of the grade for Total small seeds, attrition, dust and chaff. (Column #2 in the Barley Export grade determinant table)

Should the percentage concentration of either of the factors determined in steps 1 through 4 exceed the specifications set out in columns 1 or 2 of the barley export grade determinant table, the sample will be considered to be not commercially clean. Dockage will be assessed on samples determined to be not commercially clean by following the procedures defined under *Determination of dockage*.

Determination of dockage

Definitions

Dockage is assessed to the nearest 0.1%.

Dockage is defined under the Canada Grain Act as "any material intermixed with a parcel of grain, other than kernels of grain of a standard of quality fixed by or under this Act for a grade of that grain, that must and can be separated from the parcel of grain before that grade can be assigned to the grain." Dockage is removed by following the cleaning procedures described in this section of the guide.

The sample as it arrives is referred to as the uncleaned or dirty sample. Its weight is the **gross weight** of the sample. Dockage is assessed on the gross weight of the sample.

Dockage is assessed in two stages.

1. Follow *Normal cleaning procedures*, using the Carter dockage tester.
2. Follow procedures for *Cleaning for grade improvement*. This cleaning can be done at any time after normal cleaning has been completed.

Dockage not reported

▲ **Important:** Dockage is not reported for samples grading

- *Barley, Sample CW/CE, Account Fireburnt*
- *Barley, Sample Salvage*
- *Barley, Sample Condemned*

Normal cleaning procedures

▲ **Important:** Wear gloves and a mask to handle any samples that you suspect may contain hazardous substances.

1. Set up the Carter dockage tester as follows:

Feed control	#5
Air control	No. 6
Riddle	No. 6
Top sieve	No. 6 buckwheat
Centre sieve	No. 5 buckwheat
Bottom sieve	Blank tray
Sieve cleaner	Off

2. Using a Boerner-type divider, divide the uncleaned sample to obtain a representative portion.
   - Official samples should be at least 900 grams.
   - Unofficial samples must be at least 750 grams.

3. Turn on the Carter dockage tester.
4. Pour the sample into the hopper.
5. After the sample has passed through the machine, turn on the sieve cleaner control for 2 to 3 seconds to remove kernels lodged in the sieve.
6. Turn off the dockage tester.
7. Lightly snap the retainer rod of the aspiration pan to loosen material gathered on the air screen.

   ▲ **Important:** These are the normal settings. Ensure when you aspirate general purpose barley that you do not remove light weight barley from the sample.

   If the aspirated material contains lightweight barley,

   1. Return the material to the sample.
   2. Reset the Carter dockage tester with a lower air setting to remove only lightweight dockage material.
   3. Pass it through the Carter dockage tester again.

8. Remove the aspiration pan.
9. Determine dockage, using the list under *Composition of dockage*.

Composition of dockage

Dockage includes

- Material removed over the No. 6 riddle
- Lightweight material removed by aspiration
- Material that is removed by the No. 5 buckwheat Carter sieve
- A maximum of 10% of soft earth pellets handpicked from the clean sample
- Material removed by *Cleaning for grade improvement*

Cleaning for grade improvement

If the grade of a sample can be improved by additional cleaning, perform the cleaning and add the additional material to dockage. Cleaning for grade improvement can be done at any time after normal cleaning.

1. After normal cleaning, examine the material to be removed and select your equipment according to the material you want to remove. See the table *Cleaning for grade improvement—Barley* for the list of equipment.
2. Sieve the sample by hand, or pass it through the Carter dockage tester, depending on the material.

   ▲ **Important:** When you use a hand sieve, move the sieve from left to right 30 times, using a sifting motion. One time is one complete motion from the centre, to one side, to the other side, and back to the centre. The total distance from left to right is 20 cm, about eight inches.

3. Weigh the additional dockage and add it to the original dockage.

Cleaning for grade improvement—Barley

Material to be removed	Equipment	Effect on composition of dockage
Large seeds	No. 6 buckwheat hand sieve	Large seeds are • Seeds that do not pass through the No. 4.5 round-hole sieve • Grains other than cereal grains, such as peas, beans, corn flaxseed and domestic buckwheat • Ragweed and Tartary buckwheat Assess material as dockage, provided the grade is improved and not more than 5.0% of barley is removed.
Covered smut and false loose smut	Carter dockage tester, set up for *Normal cleaning procedures,* with air control set to 7	If the percentage by weight of material removed is • Less than 2.0% of the gross weight of the sample, add to dockage • 2.0% or more of the gross weight of the sample, the sample is sent to the Chief Grain Inspector for review
Wild oats, shrunken barley and rye grass	No. 9x9 wire hand sieve	For malting and the select hulless grades, wild oats, shrunken barley and rye grass that exceed the grade tolerance are included in dockage.
Attached awns	Hand rub Carter dockage tester for aspiration	Removes awns Separates detached awns from working sample. Awns removed to be included in dockage.

Optional analysis

Where a shipper requests special cleaning of a carlot of grain at a terminal or transfer elevator, and the elevator manager agrees, dockage material will be analyzed for the presence of grain. The percentage and grade of any grain contained in the dockage will be reported and elevator stocks will be adjusted on the basis of the analysis. Agreement of the shipper and unload elevator must be conveyed to the CGC in writing prior to the analysis being performed.

Procedures

1. Analyze the official sample.
2. Record the following on inspection records:
   - The percentage by gross weight to the nearest 0.1% and the grade of barley.
   - The percentage by gross weight to the nearest 0.1% and the grade of grain separable from dockage.
   - The percentage of dockage.

     Example
     95.0% Barley, No. 1 CW
     4.0% Domestic Mustard Seed, No. 1 CAN Oriental
     1.0% dockage

Grading

Important definitions

Net weight of sample

The sample after cleaning and removal of dockage is referred to as the cleaned sample. Its weight is the net weight of the sample. Percentages by weight for grading refer to percentages of the cleaned sample, the net weight.

Kernel counts (K)

The kernel count is the number of kernel-sized pieces in a 500 gram sample.

- To do kernel counts, you must have 500 g of cleaned sample.
- All grading is done on representative portions divided down from the cleaned sample using a Boerner-type divider.

Hazardous substances in samples

Wear gloves and a mask to handle any samples that you suspect may contain hazardous substances. Hazardous substances are defined in the Regulations as "any pesticide, herbicide or desiccant."

Representative portion for grading

All grading is done on representative portions divided down from the cleaned sample, using a Boerner-type divider.

When the concentration of the grading factor is . . .	**Then use . . .**
Low	Optimum portion size
High	Minimum portion size or more **(do not use less)**

Values in this table represent a range of recommended portions of samples for grading.

Representative portion of barley for grading, grams

Grading factor	Minimum	Optimum	Export
Adhered hulls	100	250	250
Barley of other types	10	10	10
Broken	25	50	50
Covered smut and false loose smut	working sample	working sample	working sample
Ergot	500	1000	1000
Excreta	working sample	working sample	working sample
Fireburnt	500	working sample	working sample
Frost	25	100	100
Fusarium damage	25	100	100
Heated	25	100	100
Inseparable seeds — malting and hulless	100	working sample	working sample
Inseparable seeds — general purpose	100	100	100
Odour	working sample	working sample	working sample
Other cereal grains	50	100	250
Peeled and broken	50	100	100
Plump and thin	250	250	250
Rotted kernels	50	250	100
Sclerotinia sclerotiorum	500	1000	1000
Severe mildew	50	100	100
Soft earth pellets	working sample	working sample	working sample
Sprouted	25	25	25
Stones	500	1000	1000
Varieties with adhered hulls	50	100	250
Weathered	working sample	working sample	working sample
Wild oats	50	100	250

Grading factors

Adhered hulls (ADHULLS)

Adhered hulls are kernels of hulless varieties with hulls that have not been removed during harvesting. See *Varieties with adhered hulls.*

Representative portion for analysis

Minimum—100 g Optimum—250 g Export—250 g

Barley of other types (BOOT)

In two-row barley, barley of other types is any six-row variety. In six-row barley, barley of other types is any two-row variety.

Representative portion for analysis

Minimum—10 g Optimum—10 g Export—10 g

Broken (BKN)

Broken kernels are pieces that are less than three-quarters of a whole kernel and kernels with the germ end broken off.

Representative portion for analysis

Minimum—25 g Optimum—50 g Export—50 g

Contaminated grain

▲ **Important:** Wear gloves and a mask to handle any sample that is suspected of containing contaminated grain.

Contaminated is defined in the *"Canada Grain Act"* as; "Contaminated means, in respect of grain, containing any substance in sufficient quantity that the grain is unfit for consumption by persons or animals or is adulterated within the meaning of the regulations made pursuant to sections B.01.046(1), B.15.001 and B.15.002(1) of the *Food and Drugs Act.*"

Samples deemed to be contaminated by the Grain Research Laboratory in consultation with the Chief Grain Inspector for Canada are graded *Barley, Sample Condemned.*

Covered smut and false loose smut (SMUT)

There are no specific numeric tolerances for smut. In evaluating smut as a grading factor, consider

- The degree of smut tag on the kernels
- The number of pieces of covered smut left in the cleaned sample

Representative portion for analysis

Minimum—working sample Optimum—working sample Export—working sample

If the sample . . .	Then the grade is . .		
	Malting	Hulless	General purpose
Contains about 5K of covered smut and no tagged kernels	*Barley, Select CW/CE Two-row/Six-row*	*Barley, Standard CW/CE Hulless*	*Barley, No. 1 CW/CE*
Contains many pieces of covered smut and smut-tagged kernels	*Barley, Standard Select CW/CE Two-row/Six-row*	*Barley, Sample CW/CE Hulless, Account Smut*	*Barley, No. 2 CW/CE*
Is severely contaminated	*Barley, Sample CW/CE Two-row/Six-row, Account Smut*	*Barley, Sample CW/CE Hulless, Account Smut*	*Barley, Sample CW/CE, Account Smut*

Earth pellets (EP)

- Hard earth pellets are pellets that do not crumble under light pressure.
- See *Stones*.
- Soft earth pellets are pellets that crumble under light pressure.
  See *Soft earth pellets*.

Ergot (ERG)

Ergot is a plant disease producing elongated fungus bodies with a purplish-black exterior, a purplish-white to off white interior, and a relatively smooth surface texture.

Representative portion for analysis

Minimum—500 g	Optimum—1000 g	Export—1000 g

Procedures

For *CE* and *CW* hulless grades

- If the number of ergot pieces is not excessive, determine the kernel count.
- If the number of ergot pieces is excessive, determine the weight of stones as a percentage of the net weight of the sample.

For all other *CW* grades
Determine the weight of ergot as a percentage of the net weight of the sample.

Excreta (EXCR)

▲ **Important:** Wear gloves and a mask to handle any samples that you suspect may contain excreta.

Representative portion for analysis

Minimum—working sample	Optimum—working sample	Export—working sample

Fertilizer pellets (FERT PLTS)

Fertilizer pellets are typically either small, round and white or irregular shaped and pink or red. Fertilizer pellets are not considered a hazardous substance however there is no visible means of assuring that material resembling fertilizer pellets is not some other contaminant.

Representative portion for analysis

Minimum—working sample	Optimum—working sample	Export—working sample

Procedures

- Handpick any fertilizer pellets and determine the concentration basis the net working sample.
- Fertilizer pellets are assessed as stones when the concentration does not exceed 1.0% of the net sample weight.
- Samples containing fertilizer pellets in excess of 1.0% of the net sample weight are graded *Barley, Held IP Suspect Contaminated Grain.*

Note: Canadian Grain Commission personnel should refer to ISO national work instruction "*Suspect Contaminated Grain, Handling Procedures*" for procedures to be followed when handling samples containing fertilizer pellets.

Fireburnt (FBNT)

Fireburnt kernels charred or scorched by fire. A cross-section of a fireburnt kernel resembles charcoal with numerous air holes. The air holes result in a low weight kernel which crumbles easily under pressure.

Representative portion for analysis

Minimum—500 g	Optimum—working sample	Export—working sample

Frost (FR)

For varieties with hulls—frost-damaged kernels have distinctly indented backs, and usually a loose hull. Kernels with a light wrinkling from frost are not considered frost-damaged.

For hulless varieties—frost-damaged kernels have severe wrinkling and translucent endosperms.

▲ **Important:** Determine frost-damaged kernels and *Peeled and broken* prior to sizing the sample. Sizing tends to peel kernels.

Representative portion for analysis

Minimum—25 g	Optimum—100 g	Export—100 g

Procedures—Malting and hulless grades

1. Use a representative portion of at least 25 grams of the cleaned sample.
2. Determine the percentage of frost-damaged kernels.

Fusarium mould (FUS MLD)

Fusarium-damaged kernels of barley are discoloured by pink, orange or black encrustations of fusarium mould. Under magnification, the black encrustations appear raised above the surface of the kernel and are surrounded by a white mould. The black encrustations can be scraped off.

Some degree of judgment is required when identifying kernels with the fusarium mould. Only those kernels which meet this description are to be designated as fusarium damaged.

Representative portion for analysis

Minimum—25 g
Optimum—100 g
Export—100 g

Procedures

Confirm the presence of fusarium mould using a 10-power magnifying lens.

Heated (HTD)

Heated kernels have the colour or odour typical of grain that has deteriorated in storage or has been damaged by artificial drying. The hull over the germ of the heated kernels often appears discoloured, usually to a golden brown.

Representative pearled portion for analysis

Minimum—25 g
Optimum—100 g
Export—100 g

Procedures

A representative portion of the cleaned sample is passed through a barley pearler for up to 10 seconds. When the hull is removed by pearling the germ appears red or brown. As the degree of heat damage increases, a greater portion of the pearled kernel exhibits the red discolouration.

Inseparable seeds (INSEP SDS)

Inseparable seeds are those not removed by the cleaning process, usually large seeds. See *Glossary*.

Representative portion for analysis—malting and hulless grades

Minimum—100 g
Optimum—working sample
Export—working sample

Representative portion for analysis—general purpose grades

Minimum—100 g
Optimum—100 g
Export—100 g

Procedures

- Assess as dockage if they are removed by *Cleaning for grade improvement.*
- Malting and hulless grades may not contain any large oil-bearing seeds such as sunflower seeds, safflower seeds or soybeans.

Mildew (MIL)

Mildew is a fungal condition that develops in unthreshed grain usually under conditions of excessive moisture. The affected kernels are grayish in colour and lower in quality. In the evaluation of mildew, consider the number of affected kernels and their severity. See *Severe mildew*.

Odour (ODOR)

There is no numeric tolerance for odour. Consider

- The basic quality of the sample
- The type and degree of the odour
- The presence of visible residue causing the odour

Representative portion for analysis

Minimum—working sample	Optimum—working sample	Export—working sample

If odour is the grade determinant and there is . . .	Then the grade is . . .
A distinct, objectionable odour, not associated with the quality of the grain, but not heated or fireburnt	*Barley, Standard Select CW/CE Two-row/Six-row* *Barley, Sample CW/CE Hulless Account Odour* *Barley, Sample CW/CE Account Odour*
A distinct, heated odour	*Barley, Standard Select CW/CE Two-row/Six-row* *Barley, Sample CW/CE Hulless Account Heated* *Barley, Sample CW/CE Account Heated*
A distinct, fireburnt odour	*Barley, Standard Select CW/CE Two-row/Six-row* *Barley, Sample CW/CE Hulless Account Fireburnt* *Barley, Sample CW/CE Account Fireburnt*

Other cereal grains (OCG)

Other cereal grains include wheat, rye, oats or triticale remaining in the cleaned sample.

Representative portion for analysis

Minimum—50 g	Optimum—100 g	Export—250 g

Peeled and broken (PLD BKN)

Peeled kernels are kernels with at least one of the following characteristics:

- One-third or more of the hull is removed, including kernels of hulless barley
- The germ is fully exposed
- The hull is badly frayed or ruptured over the germ end without evidence of germination
- The hull is removed along both edges.

Broken kernels are pieces of kernels that are less than three-quarters of a whole kernel and kernels with the germ end broken off.

▲ **Important:** Determine peeled and broken and frost-damaged kernels prior to sizing the sample. Sizing tends to peel kernels.

Representative portion for analysis

Minimum—50 g	Optimum—100 g	Export—100 g

Plump and thin kernels (PLMP, THIN)

The process for determining plump and thin kernels is called sizing.

- Plump kernels are kernels that remain on top of or lodged in the No. 6 slotted sieve. These are a grading factor for malting barley only.
- Thin kernels are kernels that pass through the No. 5 slotted sieve. These are a grading factor for malting and hulless barley.

▲ **Important:** Determine frost-damaged kernels and peeled and broken prior to sizing the sample. Sizing tends to peel kernels.

Procedures

1. Using a Boerner-type divider, divide a representative portion of not less than 250 grams from the cleaned sample.
2. Set the Carter dockage tester as follows:

Feed control	# 5
Air control	Off
Riddle	None
Top sieve	No. 6 slotted
Centre sieve	No. 5 slotted
Bottom sieve	Blank tray
Sieve cleaner control	Off

3. Pass the representative portion through the Carter dockage tester once.
4. When most of the sample has passed over the sieves, turn on the sieve cleaner control for five kicks of the machine to loosen lodged kernels.

   ▲ **Important:** Do not rap sieves in the machine to loosen lodged kernels.

5. Remove each sieve carefully from the machine.
6. Remove lodged kernels from each sieve. Add them to the barley that passed over that sieve.
7. Weigh separately
   - Plump kernels on top of or lodged in No. 6 slotted sieve
   - Thin kernels that passed through the No. 5 slotted sieve

Representative portion for analysis

Minimum—250 g Optimum—250 g Export—250 g

Rotted kernels (ROT KRNL)

Rotted kernels are discoloured, swollen, soft and spongy as a result of decomposition by fungi or bacteria. Consider rotted kernels in combination with severely mildewed and heated.

Representative portion for analysis

Minimum—50 g Optimum—250 g Export—100 g

Sclerotinia sclerotiorum (SCL)

Sclerotinia sclerotiorum is a fungus producing hard masses of fungal tissue, called *sclerotia*. The sclerotia vary in size and shape, have a course surface texture, vary in exterior color from dark black to gray to white and have a pure white interior.

Representative portion for analysis

Minimum—500 g Optimum—1000 g Export—1000 g

Severely mildewed (SEVMIL)

Severe mildew refers to kernels that are severely blackened by mildew. See *Mildew*. Consider severe mildew in combination with rotted and heated kernels.

Representative portion for analysis

Minimum—50 g Optimum—100 g Export—100 g

Smut

See Covered smut and false loose smut.

Soft earth pellets (SEP)

Soft earth pellets are

- Earth pellets that crumble into fine dust under light pressure, using a finger only—if they do not crumble, they are considered *Stones*.
- Any non-toxic material of similar consistency

Representative portion for analysis

Minimum—working sample Optimum—working sample Export—working sample

Procedures

1. Handpick soft earth pellets from a representative portion of the cleaned sample.
2. Soft earth pellets constituting 10.0% or less of the sample are assessed as dockage.
3. Where soft earth pellets represent more than 10% of the net weight, the sample is graded *Barley, Sample CW/CE Account Admixture*.

Sprouted (SPTD)

Sprouted kernels show definite signs of germination.

Procedures for malting grades

1. Select a representative portion of not less than 25 grams.
2. Pass the sample through the pearler for two or three seconds.
3. Analyse the lightly pearled sample for evidence of germination.

General purpose grades

Analyse without pearling.

Representative portion for analysis

Minimum—25 g	Optimum—25 g	Export—25 g

Stones (STNS)

Stones are hard shale, coal, hard earth pellets, and any other non toxic materials of similar consistency. Fertilizer pellets are assessed as stones when constituting 1.0% or less of the net sample weight. (See *Fertilizer pellets* for specific procedures to be followed when samples contain fertilizer pellets.)

Representative portion for analysis

Minimum—500 g	Optimum—1000 g	Export—1000 g

Procedures

1. Handpick stones from a representative portion of the cleaned sample.
2. Determine stone concentration in the net sample.

- In western Canada samples of grain containing stones in excess of "basic grade" tolerances, up to 2.5% are graded *Barley, Rejected "basic grade" Account Stones*. The "*basic grade*" refers to a grade established in the Canada Grain Regulations (grades listed in the first column in grade determinant tables) that would have been assigned to the sample if it contained no stones.
- In eastern Canada samples of grain containing stones in excess of grade tolerances are degraded to lower grades. Samples containing stones in excess of the tolerance of the lowest grade established by regulation up to 2.5% are graded *Barley, Sample Canada Eastern/Can Account Stones.*
- In western and eastern Canada grain containing more than 2.5% stones is graded *Barley, Sample Salvage.*

Examples: Western Canada

Excerpt from grade determinant tables for
Barley, CW Hulless

Grade name	Stones
Select CW Two-row Hulless	2K
Select CW Six-row Hulless	2K
Standard CW Hulless	5K

K Number of kernel-sized pieces in 500 g

Basic grade:.......................... *Barley, Select CW Two-row Hulless*

Reason for basic grade:....... Stained

If the above sample contained	Grade in western Canada
4K stones	*Barley, Rejected Select CW Two-row Hulless Account Stones*
10K stones	*Barley, Rejected Select CW Two-row Hulless Account Stones*
3.0% stones	*Barley, Sample Salvage*

Examples: Eastern Canada

Excerpt from grade determinant tables for
Barley, CE Hulless

Grade name	Stones
Select CE Two-row Hulless	2K
Select CE Six-row Hulless	2K
Standard CE Hulless	5K

K Number of kernel-sized pieces in 500 g

Basic grade:.......................... *Barley, Select CE Two-row Hulless*

Reason for basic grade:....... Stained

If the above sample contained	Grade in eastern Canada
4K stones	*Barley, Standard CE Hulless*
10K stones	*Barley, Sample CE Hulless Account Stones*
3.0% stones	*Barley, Sample Salvage*

Test weight (TWT)

Test weight is the weight of a measured volume of grain expressed in kilograms per hectolitre. If a barley sample contains kernels with attached awns that reduce the test weight and affect the grade, see procedures for *Cleaning for grade improvement.*

Thin kernels (THIN)

The process of determining the percentage by weight of thin kernels is called sizing. For sizing of malting barley, see *Plump and thin kernels*.

Thin kernels are kernels that pass through the No. 5 slotted sieve. These are a grading factor for malting and hulless barley.

▲ **Important:** Determine frost-damaged kernels and peeled and broken first. Then size the sample. Sizing tends to peel kernels.

For hulless grades only—the general appearance of the sample and factors other than size are taken into account in grading. Samples scant in sizing requirements but otherwise sound are given the benefit of the doubt in grading.

Representative portion for analysis

Minimum—250 g Optimum—250 g Export—250 g

Procedures

1. Obtain a representative portion of not less than 250 grams of the cleaned sample.
2. Set up the Carter dockage tester as follows:

Feed control	#5
Air control	Off
Riddle	None
Top sieve	None
Centre sieve	No. 5 slotted
Bottom sieve	Blank tray
Sieve cleaner control	Off

3. Run the representative portion through the Carter dockage tester once.
4. When the bulk of the sample has passed over the sieves, turn on the sieve cleaner control for only five kicks of the machine to loosen lodged kernels.

   ▲ **Important:** Do not rap sieves in the machine to loosen lodged kernels.

5. Weigh thin kernels that pass through the No. 5 slotted sieve

Treated seed and other chemical substances

Treated seed

Treated seed is grain that has been coated with an agricultural chemical for agronomicpurposes. These seed dressings contain a dye to render the treated seed visuallyconspicuous. The colour of the dye varies depending upon the type of treatment and the type of grain. The current Canadian colour standards for pesticide seed treatments are: cereals–pink or red, canola–baby blue or green. Seed treated with an inoculant may have a green stain. The coatings or stains may appear greasy or powdery and surface area distribution ranges from tiny flecks to complete coverage.

Other chemical substances

Other chemical substances refers to any chemical residues either adhering to the kernel or remaining in the sample and to samples having a chemical odour of any kind.

▲ **Important:** Wear gloves and a mask to handle any samples that you suspect may contain contaminated grain.

Representative portion for analysis

Minimum—working sample
Optimum—working sample
Export—working sample

If a sample is suspected of being coated with a pesticide, desiccant, inoculant or if the sample contains evidence of any foreign chemical substance other than fertilizer pellets, the sample shall be graded *Barley, Held IP Suspect Contaminated Grain.*

Note: Canadian Grain Commission personnel should refer to ISO national work instruction "*Suspect Contaminated Grain, Handling Procedures*" for specific procedures to be followed when handling samples suspected of containing treated seed or other chemical substances.

Varieties with adhered hulls

For select hulless barley—varieties with adhered hulls are considered as *Other cereal grains.*

For standard hulless barley—varieties with adhered hulls are any kernels of non-hulless varieties.

Representative portion for analysis

Minimum—50 g
Optimum—100 g
Export—250 g

Weathered (WEATH)

Weathered kernels are discoloured by weathering to a very deep yellow or light brown. Severely weathered kernels are severely discoloured. They may be dark brown, heavily stained or distinctly bleached and may also be mildewed. Consider the number of affected kernels and their condition when you assess the general colour of the sample.

Representative portion for analysis

Minimum—working sample
Optimum—working sample
Export—working sample

Wild oats (WO)

Wild oats is an annual grassy weed. The seeds vary in colour from white to black. They are normally more slender than domestic oats, and have a slanting, circular depressed scar, sometimes called a sucker mouth, at the base, and a bent twisted awn.

Representative portion for analysis

Minimum—50 g	Optimum—100 g	Export—250 g

Primary grade determinants tables

Barley, Canada Western/Canada Eastern Malting (CW/CE)

	Standard of quality				Standard of quality					
Grade name	Minimum test weight kg/hL (g/0.5 L)	Variety	Degree of soundness	Barley of other types %	Fireburnt %	Frost %	Fusarium %	Heated, rotted, severely mildewed %	Peeled and broken %	Sprouted %
Special Select CW/CE Two-row	63 (303)	Any selected variety of the class Barley,Canada Western/Eastern Malting Two-row designated as such by Order of the Commission	Reasonably sound, fairly well matured, may be moderately weather-stained, but not severely discoloured	1	Nil	0.2	Nil	Nil	4	Nil
Special Select CW/CE Six-row	62 (298)	Any selected variety of the class Barley,Canada Western/Eastern Malting Six-row designated as such by Order of the Commission	Reasonably sound, fairly well matured, may be moderately weather-stained, but not severely discoloured	1	Nil	0.2	Nil	Nil	4	Nil
Select CW/CE Two-row	61 (293)	Any selected variety of the class Barley,Canada Western/Eastern Malting Two-row designated as such by Order of the Commission	Fairly sound, may be slightly immature and moderately weather-stained or discoloured	3	Nil	1	0.2	Nil	6	0.5
Select CW/CE Six-row	60 (288)	Any selected variety of the class Barley,Canada Western/Eastern Malting Six-row designated as such by Order of the Commission	Fairly sound, may be slightly immature and moderately weather-stained or discoloured	3	Nil	1	0.2	Nil	6	0.5
Standard Select CW/CE Two-row/Six-row	No minimum	Any selected variety of the class Barley,Canada Western/Eastern Malting Two-row or Six-row designated as such by Order of the Commission	Excluded from other grades of malting quality barley on account of weather-staining or discolouration	No limit	No limit	No limit	0.2	No limit	No limit	No limit
Grade if specs for Standard Select CW/CE Two-row/Six-row not met		Non designated varieties which are selected for malting purposes are only eligible for the grade *Barley, Sample CW/CE Two-row/Six-row Account Variety*					*Barley, Sample CW/CE Two-row/Six-row Account Fusarium Damage*			

Note: Barley not selected for malting will be graded according to quality into the "General Purpose" grades.

Barley, Canada Western/Canada Eastern Malting (CW/CE), continued

	Sizing		Foreign material								
	Plump %	Thin %	Ergot %		Excreta %	Inseparable seeds %	Other cereal grains %	Sclerotinia %	Stones %	Wild oats %	Total %
Grade name			CW	CE							
Special Select CW/CE Two-row	85	3	Nil	Nil	0.01	0.2 Free of large oil-bearing seeds	1	0.01	0.02	0.2	1.0
Special Select CW/CE Six-row	75	4	Nil	Nil	0.01	0.2 Free of large oil-bearing seeds	1	0.01	0.02	0.2	1.0
Select CW/CE Two-row	80	3	**0.025**	1K	0.01	0.2 Free of large oil-bearing seeds	1	0.01	0.02	0.5	**1.5**
Select CW/CE Six-row	70	4	**0.025**	1K	0.01	0.2 Free of large oil-bearing seeds	1	0.01	0.02	0.5	**1.5**
Standard Select CW/CE Two-row/Six-row	No minimum	No limit	No limit		0.01	0.2 Free of large oil-bearing seeds	No limit	No limit	No limit	No limit	No limit
Grade if specs for Standard Select CW/CE Two-row/Six-row not met					*Barley Sample Select CW/CE Two-row/Six-row Account Excreta*	*Barley Sample Select CW/CE Two-row/Six-row Account Admixture*					

K Number of kernel-sized pieces in 500 g

Note: Barley not selected for malting will be graded according to quality into the "General Purpose" grades.

Barley, Canada Western/Canada Eastern Hulless (CW/CE)

	Standard of quality					Damage				
Grade name	**Minimum test weight kg/hl (g/0.5 l)**	**Varieties with adhered hulls %**	**Other hulless varieties %**	**Total adhered hulls %**	**Degree of soundness**	**Broken %**	**Fireburnt %**	**Frost %**	**Heated, rotted, severely mildewed %**	**Sprouted %**
Select CW/CE Two-row Hulless	75 (360)	Considered as other cereal grains	5	5	Fairly sound, may be slightly immature and moderately weather-stained or discoloured	4	Nil	2	0.2	0.5
Select CW/CE Six-row Hulless	74 (355)	Considered as other cereal grains	5	5	Fairly sound, may be slightly immature and moderately weather-stained or discoloured	4	Nil	2	0.2	0.5
Standard CW/CE Hulless	72 (346)	15	No limit	15	Reasonably sweet, may be frost-damaged, weather-stained or otherwise damaged	15	Nil	No limit	0.5	10
Grade, if Standard specs not met	*Barley, Sample CW/CE Hulless Account Light Weight*	50% or less–*Barley, Sample CW/CE Hulless Account Adhered Hulls*		*Barley, Sample CW/CE Hulless Account Adhered Hulls*		*Barley, Sample Broken Grain*	*Barley, Sample CW/CE Hulless Account Fireburnt*		*Barley, Sample CW/CE Hulless Account Heated*	*Barley, Sample CW/CE Hulless Account Sprouted*

K Number of kernel-sized pieces in 500 g

Barley, Canada Western/Canada Eastern Hulless (CW/CE), continued

	Sizing	Foreign material							
Grade name	**Thin %**	**Ergot %**	**Excreta %**	**Inseparable seeds %**	**Other cereal grains %**	**Sclerotinia %**	**Stones %**	**Wild oats %**	**Total %**
Select CW/CE Two-row Hulless	5	3K	0.01	0.2 Free of large oil-bearing seeds	1	0.01	2K	0.5	1
Select CW/CE Six-row Hulless	5	3K	0.01	0.2 Free of large oil-bearing seeds	1	0.01	2K	0.5	1
Standard CW/CE Hulless	No limit	0.05	0.02	0.2	3	0.01	5K	1	3
Grade, if Standard specs not met		*Barley, Sample CW/CE Hulless Account Ergot*	*Barley, Sample CW/CE Hulless Account Excreta*	*Barley, Sample CW/CE Hulless Account Admixture*	50% or less– *Mixed Grain, CW/CE Barley*	*Barley, Sample CW/CE Hulless Account Admixture*	2.5% or less– *Barley, Rejected (grade) Account Stones* or *Barley, Sample CE Hulless Account Stones* Over 2.5%– *Barley, Sample Salvage*	50% or less– *Mixed Grain, CW/CE Barley*	50% or less– *Mixed Grain, CW/CE Barley*

K Number of kernel-sized pieces in 500 g

Barley, Canada Western/Canada Eastern General Purpose (CW/CE)

	Standard of quality			Damage				
	Minimum test weight kg/hl (g/0.5 l)							
Grade name	CW	CE	Degree of soundness	Broken %	Fireburnt %	Fusarium %	Heated, rotted, severely mildewed %	Sprouted %
No. 1 CW/CE	63 (303)	60 (288)	Reasonably sweet, may be frost-damaged, weather-stained or otherwise damaged	15	Nil	1.0	0.5	10
No. 2 CW/CE	57 (274)	54 (260)	Fairly sweet, excluded from other grades of barley on account of immature or severely damaged kernels	25	0.5	1.0	2.5	20
Grade, if No. 2 specs not met	*Barley, Sample CW Account Light Weight*	*Barley, Sample CE Account Light Weight*		*Barley, Sample CW/CE Broken Grain*	*Barley, Sample CW/CE Account Fireburnt*	*Barley, Sample CW/CE Account Fusarium Mould*	*Barley, Sample CW/CE Account Heated*	*Barley, Sample CW/CE Account Sprouted*

	Foreign material							
Grade name	Ergot %	Excreta %	Inseparable seeds %	Other cereal grains %	Sclerotinia %	Stones %	Wild oats %	Total %
No. 1 CW/CE	0.05	0.02	0.2	2.5	0.01	0.15	1	2.5
No. 2 CW/CE	0.1	0.02	0.2	8	0.01	0.15	2.5	10
Grade, if No. 2 specs not met	*Barley, Sample CW/CE Account Ergot*	*Barley, Sample CW/CE Account Excreta*	*Barley, Sample CW/CE Account Admixture*	50% or less– *Mixed Grain CW/CE Barley*	*Barley, Sample CW/CE Account Admixture*	2.5% or less– *Barley, Rejected (grade) Account Stones* Over 2.5%– *Barley, Sample Salvage*	50% or less– *Mixed Grain CW/CE Barley*	50% or less– *Mixed Grain CW/CE Barley*

Export shipments

Export shipments can be commercially clean or not commercially clean.

Commercially clean

Shipments are defined as commercially clean when meeting the commercially clean specifications listed in the export grade determinant table upon following the *Determination of commercially clean* procedures described in this chapter.

No dockage is reported for samples representing commercially clean barley.

Not commercially clean (NCC)

Shipments that do not meet the standards for commercial cleanliness are referred to as *not commercially clean*. Such shipments are possible only with the permission of the CGC.

For samples representing not commercially clean shipments approved by the CGC for shipment from terminal and transfer elevators, dockage is reported to the nearest

- 0.1% for samples representing commercially clean shipments loaded from a single terminal or transfer elevator
- 0.01% for composite samples representing shipments loaded from more than one terminal or transfer elevator

less a deduction of up to 0.2% to take into account the buildup of attritional material.

Grading

Western malting barley on export is graded in accordance with primary standards and specifications.

Export grade determinants tables

	Commercial cleanliness	
Grade name	(1) Small seeds %	(2) Total, small seeds, attrition, dust and chaff %
Special select CW two-row	0.1	0.2
Special select CW six-row	0.1	0.2
Select CW two-row	0.1	0.2
Select CW six-row	0.1	0.2

	Foreign material									
	Commercial cleanliness					Mineral matter				
Grade name	(1) Small seeds %	(2) Total, small seeds, attrition, dust and chaff %	Ergot %	Large seeds %	Other cereal grains %	Stones %	Total %	Sclerotinia %	Wild oats %	Total %
No. 1 CW	0.1	0.2	0.05	0.2	2.5	0.15	0.25	0.01	1	2.5
No. 2 CW	0.1	0.2	0.1	0.2	8	0.15	0.25	0.01	2.5	10

	Sizing		Damage	
Grade name	Plump %	Thin %	Heated %	Peeled and broken %
No. 1 CW	No limit	No limit	0.5	15 Broken
No. 2 CW	No limit	No limit	2.5	25 Broken

7. Oats

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Determination of commercially clean

Dockage is not assessed on oat samples that meet the commercially clean specifications defined in the oats export grade determinant table. All samples must be analyzed to determine if they are commercially clean prior to dockage assessment. The analysis of samples which are clearly not commercially clean may consist of a visual assessment. For example, if there is no doubt that a sample contains more than 0.1% of small seeds without hand sieving and weighing the seeds then dockage will be assessed using procedures defined under Determination of dockage. Where there is any doubt regarding whether the sample is commercially clean the sample must be analyzed using the procedures outlined in steps 1 through 7 below to confirm that the sample is not commercially clean prior to assessing a dockage.

1. Using a Boerner-type divider, divide the sample to obtain a representative portion.
   - Official samples should be at least 900 grams.
   - Unofficial samples must be at least 750 grams.
2. Place approximately 250 grams of the sample at a time on the No. 5 buckwheat sieve nested over the No. 4.5 round hole hand sieve.
3. Move the sieves from left to right 30 times using a sifting motion. One complete motion is approximately 10 cm from the center to one side, back to the center, approximately 10 cm to the other side and back to the center.
4. All material passing through the No. 4.5 round hole sieve is weighed and the percentage calculated to determine if it meets the commercially clean specification of the grade for material removable through the No. 4.5 round hole sieve.
   (Column # 1 in the oat export grade determinant table)
5. Small seeds passing the No. 4.5 round hole sieve are weighed and the percentage calculated to determine if they meet the commercially clean specification of the grade for small seeds. (Column #2 in the oat export grade determinant table)
6. Large seeds removable by the No. 5 buckwheat sieve are weighed and the percentage calculated to determine if they meet the commercially clean specification of the grade for large seeds removable by the No. 5 buckwheat sieve. (Column #3 in the oat export grade determinant table) (See definition of large seeds in *Glossary*)
7. The percentages of material through the No. 4.5 round hole sieve and large seeds removable by the No. 5 buckwheat sieve are added together to determine if they meet the commercially clean specification for total removable material. (Column #4 in the oat export grade determinant table)

Should the percentage concentration of any of the factors determined in steps 1 through 7 exceed the specifications set out in columns 1 to 4 of the oat export grade determinant table the sample will be considered to be not commercial clean. Dockage will be assessed on samples determined to be not commercially clean by using the procedures defined under *Determination of dockage*.

Determination of dockage

Definitions

Dockage is assessed and recorded to the nearest 0.1%.

Dockage is defined under the Canada Grain Act as "any material intermixed with a parcel of grain, other than kernels of grain of a standard of quality fixed by or under this Act for a grade of that grain, that must and can be separated from the parcel of grain before that grade can be assigned to the grain." Dockage is removed by following the cleaning procedures described in this chapter.

The sample as it arrives is referred to as the uncleaned or dirty sample. Its weight is the **gross weight** of the sample. Dockage is assessed on the gross weight of the sample.

Dockage is assessed in two stages.

1. Follow *Normal cleaning procedures*, using the Carter dockage tester.
2. Follow procedures for *Cleaning for grade improvement.* This cleaning can be done at any time after normal cleaning has been completed.

Dockage not reported

▲ **Important:** Dockage is not reported for samples grading

- Oats, Sample CW/CE, Account Fireburnt
- Oats, Sample Salvage
- Oats, Sample Condemned

Normal cleaning procedures

▲ **Important:** Wear gloves and a mask to handle any samples that you suspect may contain hazardous substances.

1. Set up the Carter dockage tester as follows:

Feed control	#5
Air control	#3
Riddle	No. 6
Top sieve	No. 6 buckwheat
Centre sieve	No. 5 buckwheat
Bottom sieve	Blank tray
Sieve cleaner control	Off

2. Using a Boerner-type divider, divide the uncleaned sample to obtain a representative portion.
    - Official samples should be at least 900 grams.
    - Unofficial samples must be at least 750 grams.
3. Turn on the Carter dockage tester.

4. Pour the sample into the hopper.
5. After the sample has passed through the machine, turn on the sieve cleaner control for two to three seconds to remove kernels lodged in the sieve.
6. Turn off the dockage tester.
7. Lightly snap the retainer rod of the aspiration pan to loosen material gathered on the air screen.

   ▲ **Important:** These are the normal settings. Ensure when you are aspirating lightweight oats that fully developed, sound oats are not removed from the sample.

   If the aspirated material contains whole, sound oats,

   1. Return the material to the sample.
   2. Reset the dockage tester with a lower air setting to remove only lightweight dockage material.
   3. Pass it through the Carter dockage tester again.

8. Remove the aspiration pan.
9. Determine dockage, using the list under *Composition of dockage*.

Composition of dockage

Dockage includes

- Material removed over the No. 6 riddle
- Lightweight material removed by aspiration
- Material that is removed by the No. 5 buckwheat sieve
- A maximum of 10% of soft earth pellets handpicked from the clean sample
- Material removed by *Cleaning for grade improvement*

Cleaning for grade improvement

If the grade of a delivery can be improved by additional cleaning, perform the cleaning and add the additional material to dockage. Cleaning for grade improvement can be done at any time.

1. After normal cleaning, examine the material to be removed and select your equipment according to the material you want to remove. See the table *Cleaning for grade improvement–Oats* for the list of equipment.
2. Sieve the sample by hand, or pass it through the Carter dockage tester, depending on the material.

   ▲ **Important:** When you use a hand sieve, move the sieve from left to right 30 times, using a sifting motion. One time is one complete motion from the centre, to one side, to the other side, and back to the centre. The total distance from left to right is 20 cm, or about 8 inches.

3. Weigh the additional dockage and add it to the original dockage.

Cleaning for grade improvement—Oats

Material to be removed	Equipment	Effect on composition of dockage
Large seeds	No. 6 buckwheat hand sieve	Large seeds are • Seeds that do not pass through the No. 4.5 round-hole sieve • Grains other than cereal grains, such as peas, beans, corn, flaxseed and domestic buckwheat • Ragweed and Tartary buckwheat Assess material as dockage, provided the grade is improved and not more than 5.0% of oats are removed.
Covered smut and false loose smut	Carter dockage tester, set up for Normal cleaning procedures, but with air control set to 7	If the percentage by weight of material removed is • Less than 2.0% of the gross weight of the sample, add to dockage • 2.0% or more of the gross weight of the sample, the sample is sent to the Chief Grain Inspector for review.

Optional analysis

Where a shipper requests special cleaning of a carlot of grain at a terminal or transfer elevator, and the elevator manager agrees, dockage material will be analyzed for the presence of grain. The percentage and grade of any grain contained in the dockage will be reported and elevator stocks will be adjusted on the basis of the analysis. Agreement of the shipper and unload elevator must be conveyed to the CGC in writing prior to the analysis being performed.

Procedures

1. Analyze the official sample.
2. Record the following on inspection records:
    - The percentage by gross weight to the nearest 0.1% and the grade of oats.
    - The percentage by gross weight to the nearest 0.1% and the grade of grain separable from dockage.
    - The percentage of dockage.

Example
95.0% Oats, No. 1 CW
4.0% Domestic Mustard Seed, No. 1 CAN Oriental
1.0% dockage

Grading

Important definitions

Net weight of sample

The sample after cleaning and removal of dockage is referred to as the cleaned sample. Its weight is the net weight of the sample. Percentages by weight for grading refer to percentages of the net weight.

Kernel counts (K)

A kernel count is the number of kernel-sized pieces in a 500 gram sample.

- To do kernel counts, you must have 500 grams of cleaned sample.
- All grading is done on representative portions divided down from the cleaned sample using a Boerner-type divider.

Hazardous substances in samples

Wear gloves and a mask to handle any samples that you suspect may contain hazardous substances. Hazardous substances are defined in the Regulations as "any pesticide, herbicide or desiccant."

Representative portion for grading

All grading is done on representative portions divided down from the cleaned sample, using a Boerner-type divider.

When the concentration of the grading factor is . . .	Then use . . .
Low	Optimum portion size
High	Minimum portion size or more **(do not use less)**

Values in the table represent a range of recommended portion sizes.

Recommended portion of oats for grading, grams

Grading factor	Minimum	Optimum	Export
Barley	25	**100**	100
Cereal grains other than barley and wheat	25	**100**	100
Covered smut and false loose smut	working sample	**working sample**	working sample
Damage	25	**25**	50
Ergot	500	**1000**	1000
Excreta	working sample	**working sample**	working sample
Fireburnt	500	**working sample**	working sample
Frost damage	5	**25**	25
Fusarium damage	25	**100**	100
Green	25	**25**	50
Heated	25	**25**	50
Hulled	25	**100**	100
Large seeds	50	**250**	250
Mildew	25	**25**	50
Odour	working sample	**working sample**	working sample
Rotted	25	**100**	100
Sclerotinia sclerotiorum	500	**1000**	1000
Soft earth pellets	working sample	**working sample**	working sample
Stones	500	**1000**	1000
Wheat	25	**100**	100
Wild oats	50	**100**	500

Grading factors

Barley (BLY)

There is a separate tolerance for barley in oats.

Representative portion for analysis

Minimum—25 g	Optimum—100 g	Export—100 g

Cereal grains other than barley and wheat

Cereal grains other than barley and wheat refers to rye and triticale.

Representative portion for analysis

Minimum—25 g	Optimum—100 g	Export—100 g

Contaminated grain

▲ **Important:** Wear gloves and a mask to handle any sample that is suspected of containing contaminated grain.

Contaminated is defined in the *"Canada Grain Act"* as; "Contaminated means, in respect of grain, containing any substance in sufficient quantity that the grain is unfit for consumption by persons or animals or is adulterated within the meaning of the regulations made pursuant to sections B.01.046(1), B.15.001 and B.15.002(1) of the *Food and Drugs Act*."

Samples deemed to be contaminated by the Grain Research Laboratory in consultation with the Chief Grain Inspector for Canada are graded *Oats, Sample Condemned.*

Covered smut and false loose smut (SMUT)

There are no specific numeric tolerances for smut. In evaluating covered smut as a grading factor, consider

- The degree of smut tag on the kernels
- The number of pieces of covered smut left in the cleaned sample

Representative portion for analysis

Minimum—working sample	Optimum—working sample	Export—working sample

If the sample . . .	Then the grade is . . .
Contains about 5K of covered smut and no tagged kernels	*Oats, No. 1 or No. 2 CW/CE*
Contains many pieces of covered smut and smut-tagged kernels	*Oats, No. 3 CW/CE* or *Oats, No. 4 CW/CE*
Is severely contaminated	*Oats, Sample CW/CE Account Smut*

Damage (DMG)

Kernels are damaged if the groats are fireburnt, heated, frost-damaged, insect damaged, sprouted, mildewed, green, rotted, badly weather stained, affected by fusarium or are otherwise damaged.

Weather staininced and/or mildewed groats are considered damaged if there is significant brown or black discolouration on 50% or more of the groat or the discolouration penetrates into the groat.

There is no limit for frost damage in Oats, No. 4 CW. When the inclusion of frost damage in *Total damage* or *Total damage and foreign material* would result in either of these totals exceeding 8%, only that percentage of frost that brings the total up to 8% is considered in grade assessment. That is, the percentage of the frost component in a sample cannot be used to assign a grade lower than Oats, No. 4 CW.

Representative portion for analysis (hulls removed)

Minimum—25 g	Optimum—25 g	Export—50 g

Determination of damage by mechanical hulling

1. Hull a divided representative portion of the clean sample to yield at least 25 grams of groats.
2. Determine the weight of damaged groats as a percentage of hulled groats.

Determination of damage by manual hulling

Use this method only if a mechanical huller is not available. To determine the percentage by weight of damaged kernels,

1. Divide a representative portion of not less than 5 grams from the cleaned sample.
2. Hull all kernels to establish whether the groats are damaged.
3. To accurately determine the percentage by weight of damaged kernels, weigh the affected groat and the oat hull together.

Earth pellets (EP)

- Hard earth pellets are pellets that do not crumble under light pressure. See *Stones*.
- Soft earth pellets are pellets that crumble under light pressure. See *Soft earth pellets*.

Ergot (ERG)

Ergot is a plant disease producing elongated fungus bodies that have a purplish-black exterior, a purplish-white to off-white interior, and a relatively smooth surface texture.

Representative portion for analysis

Minimum—500 g	Optimum—1000 g	Export—1000 g

Procedures

Determine the weight of ergot as a percentage of the net weight of the sample.

Excreta (EXCR)

▲ **Important:** Wear gloves and a mask to handle any samples that you suspect may contain excreta.

Representative portion for analysis

Minimum—working sample	Optimum—working sample	Export—working sample

Fertilizer pellets (FERT PLTS)

Fertilizer pellets are typically either small, round and white or irregular shaped and pink or red. Fertilizer pellets are not considered a hazardous substance however there is no visible means of assuring that material resembling fertilizer pellets is not some other contaminant.

Representative portion for analysis

Minimum—working sample	Optimum—working sample	Export—working sample

Procedures

- Handpick any fertilizer pellets and determine the concentration basis the net working sample.
- Fertilizer pellets are assessed as stones when the concentration does not exceed 1.0% of the net sample weight.
- Samples containing fertilizer pellets in excess of 1.0% of the net sample weight are graded *Oats, Held IP Suspect Contaminated Grain.*

Note: Canadian Grain Commission personnel should refer to ISO national work instruction "*Suspect Contaminated Grain, Handling Procedures*" for procedures to be followed when handling samples containing fertilizer pellets.

Fireburnt (FBNT)

Fireburnt kernels have been charrred or scorched by fire. A cross-section of a fireburnt kernel resembles charcoal with numerous air holes. The air holes result in a low weight kernel that crumbles easily under pressure.

Representative portion for analysis

Minimum—500 g	Optimum—working sample	Export—working sample

Foreign material (FM)

Foreign material is anything other than oats that remains in the sample after the removal of dockage. Some types of foreign material have separate tolerances.

Frost damage (FR)

Frost-damaged kernels of oats have a black or sunken ventral side and gray or black groats. Frost-damaged oat groats show discolouration in the ventral crease as a dark line. The discolouration may extend throughout the groats depending on the severity of frost damage.

There is no limit for frost damage in Oats, No. 4 CW. When the inclusion of frost damage in *Total damage* or *Total damage and foreign material* would result in either of these totals exceeding 8%, only that percentage of frost that brings the total up to 8% is considered in grade assessment. That is, the percentage of the frost component in a sample cannot be used to assign a grade lower than Oats, No. 4 CW.

Representative portion for analysis

Minimum—5 g	Optimum—25 g	Export—25 g

Procedures

Cut the kernels lengthwise through the ventral side and examine the groats to confirm frost damage symptoms.

Fusarium damage (FUS DMG)

Fusarium damage is rare on oats. It resembles fusarium damage in barley. Kernels are discoloured by pink, orange or black encrustations of fusarium mould. Under magnification, the black encrustations appear raised above the surface of the kernel and are surrounded by a white mould. The black encrustations can be scraped off.

Some degree of judgment is required when identifying kernels with the fusarium mould. Only those kernels which meet this description are to be designated as fusarium damaged.

Representative portion for analysis

Minimum—25 g	Optimum—100 g	Export—100 g

Procedures

Confirm the presence of fusarium damage using a 10-power magnifying lens.

Green (GR)

Green kernels in oats are an indication of immaturity.

- Green hulls are assessed in the general colour of the sample.
- Green groats are considered damaged.

Representative portion for analysis

Minimum—25 g	Optimum—25 g	Export—50 g

Procedures

Manually or mechanically hull the appropriate portion and examine the groats for green discolouration. Green groats are assessed as damaged. See *Damage*.

Heated (HTD)

Heated kernels have the colour or odour typical of grain that has deteriorated in storage or has been damaged by artificial drying. When the hull of a heated oat is removed, the groat appears brown or orange-red.

Representative portion for analysis

Minimum—25 g Optimum—25 g Export—50 g

Procedures

Manually or mechanically hull the appropriate portion and examine the groats.

If the discolouration affects . . .	The kernel is considered . . .
The entire groat	Heated
Only the germ	Damaged

Hulled and hulless (HULL)

Hulled oats have the hulls removed. Hulless oats have loose hulls which are usually removed during harvesting.

Groats are the oat kernels without the hulls.

If oats appear to be unprocessed and contain 95.0% or more of a hulless variety,

- Grade the sample according to the primary or export grade specifications except for the tolerances for hulled and hulless kernels.
- Add *hulless* to the grade name, for example, *Oats, No. 1 CW Hulless*.

Representative portion for analysis

Minimum—25 g Optimum—100 g Export—100 g

Large seeds (LSDS)

Large seeds are domestic and wild seeds that remain on top of the No. 4.5 round-hole sieve. Large seeds are assessed

- As dockage if they are removed by *Cleaning for grade improvement*
- As large seeds and included in *Total damage and foreign material* if they remain in the sample

Representative portion for analysis

Minimum—50 g Optimum—250 g Export—250 g

Mildew (MIL)

Mildew is a fungal condition that develops in unthreshed grain usually under conditions of excessive moisture. The affected kernels are grayish in colour and lower in quality. In the evaluation of mildew, consider the number of affected kernels and their severity.

- Hull discolouration is assessed in the general colour of the sample.
- Discoloured groats are considered as damaged when there is significant brown or black discolouration on 50% or more of the groat or the discolouration penetrates into the groat.

Representative portion for analysis

Minimum—25 g Optimum—25 g Export—50 g

Procedures

Manually or mechanically hull the appropriate portion and examine the groats for mildew discolouration. Mildewed groats are assessed as damaged. See *Damage*.

If the discolouration is . . .	The sample is considered . . .
On the groats, from mildew	Damaged
On the hull, but groats are undamaged	Superficially mildewed, but sound

Odour (ODOR)

There is no numeric tolerance for odour. Consider

- The basic quality of the sample
- The type and degree of the odour
- The presence of visible residue causing the odour

Representative portion for analysis

Minimum—working sample Optimum—working sample Export—working sample

If odour is the grade determinant and there is . . .	Then the grade is . . .
A distinct objectionable odour not associated with the quality of the grain, but not heated or fireburnt	*Oats, Sample CW/CE, Account Odour*
A distinct heated odour	*Oats, Sample CW/CE, Account Heated*
A distinct fireburnt odour	*Oats, Sample CW/CE, Account Fireburnt*

Rotted (ROT)

Rotted kernels are discoloured, swollen, and soft and spongy as a result of decomposition by fungi or bacteria. Rotted kernels in oats are considered as damaged. See *Damage*.

Representative portion for analysis

Minimum—25 g Optimum—100 g Export—100 g

Sclerotinia sclerotiorum (SCL)

Sclerotinia sclerotiorum is a fungus producing hard masses of fungal tissue, called *sclerotia*. The sclerotia vary in size and shape, have a course surface texture, vary in exterior color from dark black to gray to white and have a pure white interior.

Representative portion for analysis

Minimum—500 g
Optimum—1000 g
Export—1000 g

Soft earth pellets (SEP)

Soft earth pellets are

- Earth pellets that crumble into fine dust under light pressure, using a finger only—if they do not crumble, they are considered *Stones*
- Any non-toxic material of similar consistency

Representative portion for analysis

Minimum—working sample
Optimum—working sample
Export—working sample

Procedures

1. Handpick soft earth pellets from a representative portion of the cleaned sample.
2. Soft earth pellets constituting 10.0% or less of the sample are assessed as dockage.
3. Where soft earth pellets represent more than 10% of the net weight, the sample is graded *Oats, Sample CW/CE Account Admixture.*

Sprouted (SPTD)

Sprouted kernels show definite signs of germination. Sprouted oats are assessed as damaged. See *Damage*.

Representative portion for analysis

Minimum—10 g
Optimum—50 g
Export—50 g

Stones (STNS)

Stones are hard shale, coal, hard earth pellets, and any other non toxic materials of similar consistency. Fertilizer pellets are assessed as stones when constituting 1.0% or less of the net sample weight. (See *Fertilizer pellets* for specific procedures to be followed when samples contain fertilizer pellets.)

Representative portion for analysis

Minimum—500 g
Optimum—1000 g
Export—1000 g

Procedures

1. Handpick stones from a representative portion of the cleaned sample.
2. Determine stone concentration in the net sample.

- In western Canada samples of grain containing stones in excess of "basic grade" tolerances, up to 2.5% are graded *Oats, Rejected "basic grade" Account Stones*. The "*basic grade*" refers to a grade established in the Canada Grain Regulations (grades listed in the first column in grade determinant tables) that would have been assigned to the sample if it contained no stones.
- In eastern Canada samples of grain containing stones in excess of grade tolerances are degraded to lower grades. Samples containing stones in excess of the tolerance of the lowest grade established by regulation up to 2.5% are graded *Oats, Sample Canada Eastern/Can Account Stones.*
- In western and eastern Canada grain containing more than 2.5% stones is graded *Oats, Sample Salvage.*

Examples: Western Canada

Excerpt from grade determinant tables for
Oats, Canada Western

Grade name	Stones %
No. 1 CW	0.017
No. 2 CW	0.066
No. 3 CW	0.15
No. 4 CW	0.15

Basic grade:.......................... *Oats, No. 1 CW*

If the above sample contained	Grade in western Canada
0.05% stones	*Oats, Rejected No. 1 CW Account Stones*
1.0% stones	*Oats, Rejected No. 1 CW Account Stones*
3.0% stones	*Oats, Sample Salvage*

Examples: Eastern Canada

Excerpt from grade determinant tables for
Oats, Canada Eastern

Grade name	Stones
No. 1 CE	0.017
No. 2 CE	0.066
No. 3 CE	0.15
No. 4 CE	0.15

Basic grade:......................... Oats, No. 1 CE

If the above sample contained	Grade in eastern Canada
0.05% stones	*Oats, No. 2 CE*
1.0% stones	*Oats, Sample CE Account Stones*
3.0% stones	*Oats, Sample Salvage*

Total damage and foreign material (TDMGFM)

Total damage and foreign material includes all foreign material and all damage. Frost damage is not included in No. 4 CW Oats. When assigning a grade, choose the most appropriate grade as indicated in the table below.

If any one of, or the total of *Barley, Cereal grains other than wheat and barley,* or *Wheat,* or *Wild* oats is...	**and *Total damage* is . . .**	**Then the grade is . . .**
Above the tolerance	At or below the tolerance	See procedures for Mixed grain
At or below the tolerance	Above the tolerance	Oats, Sample CW/CE, Account Damage
Individually, each is below the tolerance, but together they exceed the tolerance for Total damage and Foreign Material		Oats, Sample CW/CE, Account Damage and Foreign Material

Treated seed and other chemical substances

Treated seed

Treated seed is grain that has been coated with an agricultural chemical for agronomic purposes. These seed dressings contain a dye to render the treated seed visually conspicuous. The colour of the dye varies depending upon the type of treatment and the type of grain. The current Canadian colour standards for pesticide seed treatments are: cereals–pink or red, canola–baby blue or green. Seed treated with an inoculant may have a green stain. The coatings or stains may appear greasy or powdery and surface area distribution ranges from tiny flecks to complete coverage.

Other chemical substances

Other chemical substances refers to any chemical residues either adhering to the kernel or remaining in the sample and to samples having a chemical odour of any kind.

▲ **Important:** Wear gloves and a mask to handle any samples that you suspect may contain contaminated grain.

Representative portion for analysis

Minimum—working sample
Optimum—working sample
Export—working sample

If a sample is suspected of being coated with a pesticide, desiccant, inoculant or if the sample contains evidence of any foreign chemical substance other than fertilizer pellets, the sample shall be graded *Oats, Held IP Suspect Contaminated Grain*.

Note: Canadian Grain Commission personnel should refer to ISO national work instruction "*Suspect Contaminated Grain, Handling Procedures*" for specific procedures to be followed when handling samples suspected of containing treated seed or other chemical substances

Varieties (VAR)

Oats are graded without reference to variety. However, for samples containing 95% or more of a hulless variety, *Hulless* forms part of the grade name, and tolerances for *Hulled and hulless* are disregarded.

Wheat (WHT)

There is a separate tolerance for wheat in oats.

Representative portion for analysis

Minimum—25 g
Optimum—100 g
Export—100 g

Wild oats (WO)

Wild oats is an annual grassy weed. The seeds vary in colour from white to black. They are normally more slender than domestic oats, and have a slanting, circular depressed scar, sometimes called a sucker mouth, at the base, and a bent twisted awn.

Representative portion for analysis

Minimum—50 g
Optimum—100 g
Export—500 g

Primary grade determinants tables

Oats, Canada Western (CW)

	Standard of quality			Damage				
Grade name	**Minimum test weight kg/hL (g/0.5 L)**	**Degree of soundness**	**Hulled and hulless %**	**Fireburnt %**	**Frost %**	**Fusarium %**	**Heated %**	**Total %**
No. 1 CW	56 (260)	Good colour, 98% of groats must be sound	6	Nil	0.1	0.1	Nil	2
No. 2 CW	53 (245)	Good colour, 96% of groats must be sound	8	Nil	4	2.0	0.1	4
No. 3 CW	51 (235)	Fair colour, 94% of groats must be sound	20	Nil	6	4	0.5	6
No. 4 CW	48 (220)	92% of groats must be sound	No limit—If sample contains 95% or more of hulless varieties, hulless becomes part of the grade name	**0.25**	No limit. Not included in total damage assessment	6	1	8
Grade, if No. 4 specs not met	*Oats, Sample CW Account Light Weight*	*Oats, Sample CW Account Damage and Foreign Material*		*Oats, Sample CW Account Fireburnt*		*Oats, Sample CW Account Fusarium Damaged*	*Oats, Sample CW Account Heated*	*Oats, Sample CW Account Damage*

Oats, Canada Western (CW), continued

	Foreign material									
Grade name	**Barley %**	**Cereal grains other than wheat or barley %**	**Ergot %**	**Excreta %**	**Large seeds %**	**Sclerotinia %**	**Stones %**	**Wheat %**	**Wild oats %**	**Total damage and foreign material %**
No. 1 CW	**0.75**	1	Nil	1 piece in 1000 g or less	0.2	Nil	**0.017**	**0.75**	1	2
No. 2 CW	**1.5**	2	**0.025**	0.01	0.3	0.05	**0.066**	**1.5**	2	4
No. 3 CW	3	3	**0.025**	0.02	0.5	0.05	**0.15**	3	3	6
No. 4 CW	8	8	0.05	0.02	1	0.1	**0.15**	8	8	8
Grade, if No.4 specs not met	See *Mixed grain*	See *Mixed grain*	*Oats, Sample CW Account Ergot*	*Oats, Sample CW Account Excreta*	*Oats, Sample CW Account Admixture*	*Oats, Sample CW Account Admixture*	2.5% or less– *Oats, Rejected (grade) Account Stones* Over 2.5% – *Oats, Sample Salvage*	See *Mixed grain*	50% or less– see *Mixed grain* Over 50% – *Mixed Feed Oats*	*Oats, Sample CW Account Damage and Foreign Material*

Oats, Canada Eastern (CE)

Grade name	Standard of quality		Hulled and hulless %	Damage			
	Minimum test weight kg/hL (g/0.5 L)	Degree of soundness		Fireburnt %	Fusarium %	Heated %	Total %
No. 1 CE	51 (235)	Well matured, good natural colour, 97% sound groats	6	Nil	0.1	Nil	0.1
No. 2 CE	49 (225)	Reasonably well matured, reasonably good natural colour, 96% sound groats	8	Nil	2.0	0.1	2
No. 3 CE	46 (210)	Fairly well matured, fair colour, 94% sound groats	20	Nil	4	1.0	4
No. 4 CE	43 (195)	86% sound groats	No limit—If sample contains 95% or more of hulless varieties, hulless becomes part of the grade name	**0.25**	6	3	6
Grade, if No. 4 specs not met	*Oats, Sample CE Account Light Weight*	*Oats, Sample CE Account Damage and Foreign Material*		*Oats, Sample CE Account Fireburnt*	*Oats, Sample CE Account Fusarium Damaged*	*Oats, Sample CE Account Heated*	*Oats, Sample CE Account Damage*

Oats, Canada Eastern (CE), continued

Grade name	Foreign material									Total damage and foreign material %
	Barley %	Cereal grains other than wheat or barley %	Ergot %	Excreta %	Large seeds %	Sclerotinia %	Stones %	Wheat %	Wild oats %	
No. 1 CE	1	3	Nil	1 piece in 1000 g or less	0.2	Nil	**0.017**	1	1	3
No. 2 CE	2	4	0.05	0.01	0.3	0.05	**0.066**	2	2	4
No. 3 CE	6	6	0.05	0.02	0.5	0.05	**0.15**	6	3	6
No. 4 CE	14	14	0.1	0.02	1	0.1	**0.15**	14	8	14
Grade, if No.4 specs not met	See *Mixed grain*	See *Mixed grain*	*Oats, Sample CE Account Ergot*	*Oats, Sample CE Account Excreta*	*Oats, Sample CE Account Admixture*	*Oats, Sample CE Account Admixture*	2.5% or less– *Oats, Sample CE Account Stones* Over 2.5%– *Oats, Sample Salvage*	See *Mixed grain*	50% or less– see *Mixed grain* Over 50% – *Mixed Feed Oats*	*Oats, Sample CE Account Damage and Foreign Material*

Export shipments

Export shipments can be commercially clean or not commercially clean.

Commercially clean

Shipments are defined as commercially clean when meeting the commercially clean specifications listed in the export grade determinant table upon following the *Determination of commercially clean* procedures described in this chapter.

No dockage is reported for samples representing commercially clean oats.

Not commercially clean (NCC)

Shipments that do not meet the standards for commercial cleanliness are referred to as not commercially clean. Such shipments are permitted only with the permission of the CGC.

For samples representing not commercially clean shipments approved by the CGC for shipment from terminal and transfer elevators, dockage is reported to the nearest

- 0.1% for samples representing commercially clean shipments loaded from a single terminal or transfer elevator
- 0.01% for composite samples representing shipments loaded from more than one terminal or transfer elevator

less a deduction of up to 0.2% to take into account the buildup of attritional material.

Grading

Western oats on export are graded using export specifications. All other oats are exported using primary specifications.

Export grade determinants tables

Oats, Canada Western (CW)

Grade name	(1) Total material through No. 4.5 round hole sieve %	(2) Small seeds %	(3) Large seeds through No. 5 buckwheat sieve %	(4) (1) + (3) Total removable material %
No. 1 CW	0.2	0.10	0.2	0.2
No. 2 CW	0.2	0.10	0.2	0.2
No. 3 CW	0.2	0.10	0.2	0.2
No. 4 CW	0.2	0.10	0.2	0.2

Grade name	Damage and foreign material												
	Damage			Barley %	Cereal grains other than wheat or barley %	Ergot %	Large seeds %	Mineral matter		Sclerotinia %	Wheat %	Wild oats %	Total damage and foreign material %
	Frost %	Heated %	Total damage %					Stones %	Total %				
No. 1 CW	0.1	Nil	2	0.75	1	Nil	0.2	0.017	0.033	Nil	0.75	1	2
No. 2 CW	4	0.1	4	1.5	2	0.025	0.3	0.066	0.066	0.025	1.5	2	4
No. 3 CW	6	0.5	6	3	3	0.025	0.5	0.15	0.25	0.025	3	3	6
No. 4 CW	No limit	1	8 excluding frost	8	8	0.05	1	0.15	0.25	0.25	8	8	8 excluding frost

The area inside dashed lines refers to factors which are assessed in determining commercial cleanliness

8. Triticale

Determination of commercially clean **8-2**

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Determination of commercially clean

Dockage is not assessed on triticale samples that meet the commercially clean specifications defined in the triticale export grade determinant table. All samples must be analyzed to determine if they are commercially clean prior to dockage assessment. The analysis of samples which are **clearly** not commercially clean may consist of a visual assessment. For example, if there is no doubt that a sample contains more than 0.05% of small seeds without hand sieving and weighing the seeds then dockage will be assessed using procedures defined under *Determination of dockage*. Where there is any doubt regarding whether the sample is commercially clean the sample must be analyzed using the procedures outlined in steps 1 through 5 below to confirm that the sample is not commercially clean prior to assessing a dockage.

1. Using a Boerner-type divider, divide the sample to obtain a representative portion.
    - Official samples should be at least 900 grams.
    - Unofficial samples must be at least 750 grams.
2. Place approximately 250 grams of the sample at a time on the No. 4.5 round hole hand sieve.
3. Move the sieves from left to right 30 times using a sifting motion. One complete motion is approximately 10 cm from the center to one side, back to the center, approximately 10 cm to the other side and back to the center.
4. All material passing through the No. 4.5 round hole sieve is weighed and the percentage calculated to determine if it meets the commercially clean specification of the grade for material removable through the No. 4.5 round hole sieve.
   (Column #2 in the tricale export grade determinant table)
5. Small seeds passing through the No. 4.5 round hole sieve are weighed and the percentage calculated to determine if they meet the commercially clean specification of the grade for small seeds. (Column #1 in the triticale export grade determinant table)

Should the percentage concentration of either of the factors determined in steps 1 through 5 exceed the specifications set out in columns 1 or 2 of the triticale export grade determinant table the sample will be considered to be not commercial clean. Dockage will be assessed on samples determined to be not commercially clean by using the procedures defined under *Determination of dockage.*

Determination of dockage

Definitions

Dockage is assessed to the nearest 0.1%.

Dockage is defined under the Canada Grain Act as "any material intermixed with a parcel of grain, other than kernels of grain of a standard of quality fixed by or under this Act for a grade of that grain, that must and can be separated from the parcel of grain before that grade can be assigned to the grain." Dockage is removed by the following cleaning procedures described in this section of the guide.

The sample as it arrives is referred to as the uncleaned or dirty sample. Its weight is the **gross weight** of the sample. Dockage is assessed on the gross weight of the sample.

Dockage is assessed in two stages.

1. Follow *Normal cleaning procedures*, using the Carter dockage tester.
2. Follow procedures for *Cleaning for grade improvement*. This cleaning can be done at any time after normal cleaning has been completed.

Dockage not reported

▲ **Important**: Dockage is not reported for samples graded

- Triticale, Sample Canada Account Fireburnt
- Triticale, Sample Salvage
- Triticale, Sample Canada Account Admixture, where all removable material is similar to the admixture
- Triticale, Sample Condemned

Normal cleaning procedures

▲ **Important**: Wear gloves and a mask to handle any samples that you suspect may contain hazaradous substances.

1. Set up the Carter dockage tester as follows:

Feed control	#6
Air control	#5
Riddle	No. 25
Top sieve	No. 6 buckwheat
Centre sieve	No. 5 buckwheat
Bottom sieve	Blank tray
Sieve cleaner control	Off

2. Using a Boerner-type divider, divide the uncleaned sample to obtain a representative portion.
    - Official samples should be at least 900 grams.
    - Unofficial samples should be at least 750 grams.
3. Turn on the Carter dockage tester.
4. Pour the sample into the hopper.
5. After the sample has passed through the machine, turn on the sieve cleaner control for two or three seconds to remove kernels lodged in the sieve.
6. Turn off the Carter dockage tester.
7. Lightly snap the retainer rod of the aspiration pan to loosen material gathered on the air screen.
8. Examine the material passing through the No. 5 buckwheat sieve.

    If any significant amount of small whole triticale passed through the No. 5 buckwheat sieve, you must resieve this portion over the No. 5 buckwheat hand sieve. Return any triticale remaining on the sieve to the cleaned sample.
9. Handpick sound large kernels of triticale from the portion passing over the riddle and return them to the cleaned sample. Do not pick kernels with long rootlets. See *Composition of dockage* and *Sprouted.*
10. Determine dockage, using the list under *Composition of dockage*.

Composition of dockage

Dockage includes

- Triticale with long rootlets removed by the riddle.
  For samples of triticale which are graded *Triticale Sample CAN Account Sprouted* any triticale with long rootlets that was removed by the riddle will be returned to the sample and not assessed as dockage. (See *Sprouted*)

- A maximum of 10% of soft earth pellets handpicked from the clean sample
- Material other than triticale removed by the No. 25 riddle
- Material removed by aspiration
- Material that has passed through the No. 5 buckwheat Carter sieve
- Material removed by *Cleaning for grade improvement*

Cleaning for grade improvement

If the grade of a delivery can be improved by additional cleaning, perform the cleaning and add the additional material to dockage. Cleaning for grade improvement can be done at any time.

1. Sieve the sample by hand using the appropriate sieve. See the table *Cleaning for grade improvement—Triticale* for the list of sieves.

▲ **Important:** When you use a hand sieve, move the sieve from left to right 30 times, using a sifting motion. One time is one complete motion from the centre, to one side, to the other side, and back to the centre. The total distance from left to right is 20 cm, or about eight inches.

2. Weigh the additional dockage and add it to the original dockage.

Cleaning for grade improvement—Triticale

Material to be removed	Equipment	Effect on composition of dockage
Broken kernels	No. 6 buckwheat hand sieve	If the weight of broken kernels is over the grade tolerance but is • Less than 5.0% of the gross weight, add to dockage • 5.0% or more of the gross weight, broken kernels becomes a grading factor. Return them to the cleaned sample. See *Broken*.
Stones	No. 6 buckwheat hand sieve	If the weight of wheat removed as a percentage of the gross weight of the sample is • 5.0% or less, assess as dockage • More than 5.0%, see *Stones*, or the relevant grade determinants table.
Foreign material	No. 6 buckwheat hand sieve or the No. 9x9 wire hand sieve.	Foreign material includes cockle, wild oats and pin oats.

Optional analysis

Where a shipper requests special cleaning of a carlot of grain at a terminal or transfer elevator, and the elevator manager agrees, dockage material will be analyzed for the presence of grain. The percentage and grade of any grain contained in the dockage will be reported and elevator stocks will be adjusted on the basis of the analysis. Agreement of the shipper and unload elevator must be conveyed to the CGC in writing prior to the analysis being performed.

Procedures

1. Analyze the official sample.
2. Record the following on inspection records:
   - The percentage by gross weight to the nearest 0.1% and the grade of triticale.
   - The percentage by gross weight to the nearest 0.1% and the grade of grain separable from dockage.
   - The percentage of dockage.

Example
95.0% Triticale, No. 1 CAN
4.0% Domestic Mustard Seed, No. 1 CAN Oriental
1.0% dockage

Grading

Important definitions

Net weight of sample

The sample after cleaning and removal of dockage is referred to as the cleaned sample. Its weight is the net weight of the sample. Percentages by weight for grading refer to percentages of the net weight.

Kernel counts (K)

The kernel count is the number of kernel-sized pieces in a 500 gram sample.

- To do kernel counts you must have 500 grams of cleaned sample.
- All grading is done on representative portions divided down from the cleaned sample using a Boerner-type divider.

Hazardous substances in samples

Wear gloves and a mask to handle any samples that you suspect may contain hazardous substances. Hazardous substances are defined in the Regulations as "any pesticide, herbicide or desiccant."

Representative portion for grading

All grading is done on representative portions divided down from the cleaned sample, using a Boerner-type divider.

When the concentration of the grading factor is . . .	Then use . . .
low	optimum portion size
high	minimum portion size or more **(do not use less)**

Values in the table represent a range of recommended portion sizes.

Representative portion of triticale for grading, grams

Grading factor	Minimum	Optimum	Export
Broken	50	**100**	100
Cereal grains other than wheat	50	**100**	100
Degermed	10	**100**	100
Ergot	500	**1000**	1000
Excreta	working sample	**working sample**	working sample
Fireburnt	500	**working sample**	working sample
Fusarium damage	10	**100**	100
Heated	50	**100**	100
Matter other than cereal grains	100	**250**	250
Odour	working sample	**working sample**	working sample
Sclerotinia sclerotiorum	500	**1000**	1000
Smudge including blackpoint	100	**500**	500
Soft earth pellets	working sample	**working sample**	working sample
Sprouted	10	**100**	100
Stones	500	**1000**	1000

Grading factors

Blackpoint (BLK PT)

Blackpoint kernels have a distinct dark brown or black discolouration of the whole germ and surrounding area. Disregard a slight discolouration restricted to the germ. See *Smudge* and *Smudge, including blackpoint.*

Broken (BKN)

Broken kernels are pieces of triticale that are less than three-quarters of a whole kernel.

Representative portion for analysis

Minimum—50 g	Optimum—100 g	Export—100 g

Procedures

- In samples graded *Triticale, Sample Broken Grain*, return to the cleaned sample any broken triticale removed in cleaning but remaining on top of the No. 4.5 round-hole hand sieve.
- For reporting and grading, round down the percentage by weight of broken triticale to a whole number.

Cereal grains other than wheat

Cereal grains other than wheat in triticale includes rye, barley, oats, oat groats and wild oat groats.

Representative portion for analysis

Minimum—50 g	Optimum—100 g	Export—100 g

Contaminated grain

▲ **Important:** Wear gloves and a mask to handle any sample that is suspected of containing contaminated grain.

Contaminated is defined in the *"Canada Grain Act"* as; "Contaminated means, in respect of grain, containing any substance in sufficient quantity that the grain is unfit for consumption by persons or animals or is adulterated within the meaning of the regulations made pursuant to sections B.01.046(1), B.15.001 and B.15.002(1) of the *Food and Drugs Act*."

Samples deemed to be contaminated by the Grain Research Laboratory in consultation with the Chief Grain Inspector for Canada are graded *Triticale, Sample Condemned.*

Degermed (DGM)

Degermed kernels

- Are considered *Sprouted* if the sample contains other sprouted kernels
- Are considered sound if the sample contains no other sprouted kernels

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Earth pellets (EP)

- Hard earth pellets are pellets that do not crumble under light pressure.
  See *Stones*.
- Soft earth pellets are pellets that crumble under light pressure. See *Soft earth pellets*.

Ergot (ERG)

- Ergot is a plant disease producing elongated fungus bodies having a purplish-black exterior, a purplish-white to off white interior, and a relatively smooth surface texture.

Representative portion for analysis

Minimum—500 g
Optimum—1000 g
Export—1000 g

Procedures

- If the amount of ergot is not excessive, determine the kernel count.
- If the kernel count is excessive, determine the weight of ergot as a percentage of the net weight of the sample.

Excreta (EXCR)

▲ **Important:** Wear gloves and a mask to handle any samples that you suspect may contain excreta.

Representative portion for analysis

Minimum—working sample
Optimum—working sample
Export—working sample

Fertilizer pellets (FERT PLTS)

Fertilizer pellets are typically either small, round and white or irregular shaped and pink or red. Fertilizer pellets are not considered a hazardous substance however there is no visible means of assuring that material resembling fertilizer pellets is not some other contaminant.

Representative portion for analysis

Minimum—working sample
Optimum—working sample
Export—working sample

Procedures

- Handpick any fertilizer pellets and determine the concentration basis the net working sample.
- Fertilizer pellets are assessed as stones when the concentration does not exceed 1.0% of the net sample weight.
- Samples containing fertilizer pellets in excess of 1.0% of the net sample weight are graded *Triticale, Held IP Suspect Contaminated Grain.*

Note: Canadian Grain Commission personnel should refer to ISO national work instruction "*Suspect Contaminated Grain, Handling Procedures*" for procedures to be followed when handling samples containing fertilizer pellets.

Fireburnt (FBNT)

Fireburnt kernels are kernels charred or scorched by fire. A cross-section of a fireburnt kernel resembles charcoal with numerous air holes. The air holes result in a low weight kernel which crumbles easily under pressure.

Representative portion for analysis

Minimum— 500 g
Optimum—working sample
Export—working sample

Foreign material (FM)

Foreign material in triticale includes all material other than whole or broken triticale that remains in the sample after the removal of dockage. Many of the materials have their own separate tolerances.

Fusarium damage (FUS DMG)

Fusarium-damaged triticale is typically characterized by thin or shrunken chalk-like kernels. Fusarium-damaged kernels have a white or pinkish fibrous growth which may be visible only under a magnifying lens.

Representative portion for analysis

Minimum—10 g Optimum—100 g Export—100 g

Procedures, for severely infested samples

1. Using a Boerner-type divider, divide the representative portion.
2. Separate all kernels showing any evidence of fusarium damage, including any kernels that have a chalk-like appearance.
3. You may examine kernels using a 10-power magnifying lens to confirm evidence of a white or pinkish mould or fibrous growth. In determining fusarium damage, use only kernels with this white or pinkish mould or growth.

Heated (HTD)

Heated kernels have the colour or odour typical of grain that has deteriorated in storage or has been damaged by artificial drying. Heated triticale is not easily detected because of the natural colour variations that occur in sound triticale. Heated kernels of triticale are red or orange.

Representative portion for analysis

Minimum—50 g Optimum—100 g Export—100 g

Matter other than cereal grains (MOTCG)

Matter other than cereal grains is

- Inseparable seeds such a ragweed, Tartary buckwheat, rye grass, wild oats
- Non-cereal domestic grains such as flaxseed, corn, peas, buckwheat and lentils that remain in the cleaned sample.

Representative portion for analysis

Minimum—50 g Optimum—100 g Export—250 g

Odour (ODOR)

There is no numeric tolerance for odour. Consider

- The basic quality of the sample
- The type and degree of the odour
- The presence of visible residue causing the odour

Representative portion for analysis

Minimum—working sample	Optimum—working sample	Export—working sample

If odour is the grade determinant and there is . . .	Then the grade is . . .
A distinct objectionable odour not associated with the quality of the grain, but not heated or fireburnt	*Triticale, Sample Canada Account Odour*
A distinct heated odour	*Triticale, Sample Canada Account Heated*
A distinct fireburnt odour	*Triticale, Sample Canada Account Fireburnt*

Sclerotinia sclerotiorum (SCL)

Sclerotinia sclerotiorum is a fungus producing hard masses of fungal tissue, called *sclerotia*. The sclerotia vary in size and shape, have a course surface texture, vary in exterior color from dark black to gray to white and have a pure white interior.

Representative portion for analysis

Minimum—500 g	Optimum—1000 g	Export—1000 g

Procedures

- If the amount of sclerotinia is not excessive, determine the kernel count.
- If the kernel count is excessive, determine the weight of sclerotinia as a percentage of the net weight of the sample.

Smudge (SM)

Smudge is a discolouration on the kernel The discolouration may be brown, black or red. The discolouration is considered smudge if more than one-half the kernel is discoloured or if the discolouration extends into the crease.

Soft earth pellets (SEP)

Soft earth pellets are

- Earth pellets that crumble into fine dust under light pressure, using a finger only—if they do not crumble, they are considered *Stones*.
- Any non-toxic material of similar consistency.

Representative portion for analysis

Minimum—working sample
Optimum—working sample
Export—working sample

Procedures

1. Handpick soft earth pellets from a representative portion of the cleaned sample.
2. Soft earth pellets constituting 10.0% or less of the sample are assessed as dockage.
3. Where soft earth pellets represent more than 10% of the net weight, the sample is graded *Triticale, Sample CAN Account Admixture*.

Sprouted (SPTD)

Sprouted kernels show definite signs of germination.

Representative portion for analysis

Minimum—10 g
Optimum—100 g
Export—100 g

▲ **Important**: Kernels with long rootlets which clean out over the No. 25 riddle are either

- Included in the dockage, as described in *Composition of dockage*
- Returned to the sample and become a grading factor, in samples graded *Triticale, Sample Canada Account Sprouted*

Stones (STNS)

Stones are hard shale, coal, hard earth pellets, and any other non toxic materials of similar consistency. Fertilizer pellets are assessed as stones when constituting 1.0% or less of the net sample weight. (See *Fertilizer pellets* for specific procedures to be followed when samples contain fertilizer pellets.)

Representative portion for analysis

Minimum—500 g	Optimum—1000 g	Export—1000 g

Procedures

1. Handpick stones from a representative portion of the cleaned sample.
2. Determine stone concentration in the net sample.

Note: Stones may be removed and included in dockage if the the material removed is 5.0% or less of the gross weight of the sample. See *Cleaning for grade improvement*.

- In western Canada samples of grain containing stones in excess of "basic grade" tolerances, up to 2.5% are graded *Triticale, Rejected "basic grade" Account Stones*. The "*basic grade*" refers to a grade established in the Canada Grain Regulations (grades listed in the first column in grade determinant tables) that would have been assigned to the sample if it contained no stones.
- In eastern Canada samples of grain containing stones in excess of grade tolerances are degraded to lower grades. Samples containing stones in excess of the tolerance of the lowest grade established by regulation up to 2.5% are graded *Triticale, Sample CAN Account Stones*.
- In western and eastern Canada grain containing more than 2.5% stones is graded *Triticale, Sample Salvage*.

Examples: Western Canada

Excerpt from grade determinant tables for
Triticale, Canada

Grade name	Stones %
No. 1 Canada	0.033
No. 2 Canada	0.033
No. 3 Canada	0.066

Basic grade:.......................... *Triticale, No. 2 Canada*
Reason for basic grade:....... Mildew

If the above sample contained	Grade in western Canada
0.05% stones	*Triticale, Rejected No. 2 Canada Account Stones*
1.0% stones	*Triticale, Rejected No. 2 Canada Account Stones*
3.0% stones	*Triticale, Sample Salvage*

Examples: Eastern Canada

Excerpt from grade determinant tables for
Triticale, Canada

Grade name	Stones %
No. 1 Canada	0.033
No. 2 Canada	0.033
No. 3 Canada	0.066

Basic grade:.......................... *Triticale, No. 2 Canada*
Reason for basic grade:....... Mildew

If the above sample contained	Grade in eastern Canada
0.05% stones	*Triticale, No. 3 Canada*
1.0% stones	*Triticale, Sample Canada Account Stones*
3.0% stones	*Triticale, Sample Salvage*

Treated seed and other chemical substances

Treated seed

Treated seed is grain that has been coated with an agricultural chemical for agronomic purposes. These seed dressings contain a dye to render the treated seed visually conspicuous. The colour of the dye varies depending upon the type of treatment and the type of grain. The current Canadian colour standards for pesticide seed treatments are: cereals–pink or red, canola–baby blue or green. Seed treated with an inoculant may have a green stain. The coatings or stains may appear greasy or powdery and surface area distribution ranges from tiny flecks to complete coverage.

Other chemical substances

Other chemical substances refers to any chemical residues either adhering to the kernel or remaining in the sample and to samples having a chemical odour of any kind.

▲ **Important:** Wear gloves and a mask to handle any samples that you suspect may contain contaminated grain.

Representative portion for analysis

Minimum	Optimum	Export
working sample	working sample	working sample

If a sample is suspected of being coated with a pesticide, desiccant, inoculant or if the sample contains evidence of any foreign chemical substance other than fertilizer pellets, the sample shall be graded *Triticale, Held IP Suspect Contaminated Grain*.

Note: Canadian Grain Commission personnel should refer to ISO national work instruction "*Suspect Contaminated Grain, Handling Procedures*" for specific procedures to be followed when handling samples suspected of containing treated seed or other chemical substances

Varieties

Triticale is graded without reference to variety.

Primary grade determinants tables

Triticale, Canada (CAN)

	Standard of quality		Foreign material						
Grade name	**Minimum test weight kg/hL (g/0.5 L)**	**Degree of soundness**	**Cereal grains other than wheat %**	**Ergot %**	**Excreta %**	**Matter other than cereal grains %**	**Sclerotinia %**	**Stones %**	**Total %**
No. 1 Canada	65 (315)	Reasonably well matured, reasonably free from damaged kernels	1	4K	0.01	0.5	4K	**0.033**	**2.5**
No. 2 Canada	62 (301)	Fairly well matured, reasonably free from severely damaged kernels	2	8K	0.01	1	8K	**0.033**	4
No. 3 Canada	No minimum	Reasonably sweet, excluded from higher grades on account of light weight or damaged kernels	3	0.1	0.03	2	0.1	**0.066**	7
Grade, if No. 3 specs not met			See *Mixed grain*	*Triticale, Sample Canada Account Ergot*	*Triticale, Sample Canada Account Excreta*	*Triticale, Sample Canada Account Admixture*	*Triticale, Sample Canada Account Admixture*	2.5% or less– *Triticale, Rejected (grade) Account Stones* or *Triticale, Sample Canada Account Stones* Over 2.5%– *Triticale, Sample Salvage*	See *Mixed grain*

	Damage					
Grade name	**Broken %**	**Fireburnt %**	**Fusarium %**	**Heated %**	**Smudge and blackpoint %**	**Sprouted %**
No. 1 Canada	4	Nil	**0.25**	0.1	10	0.5
No. 2 Canada	7	Nil	0.5	**0.75**	15	2
No. 3 Canada	50	Nil	1	5	No limit	10
Grade, if No. 3 specs not met	*Sample Broken Grain*	*Triticale, Sample Canada Account Fireburnt*	*Triticale, Sample Canada Account Fusarium Damage*	*Triticale, Sample Canada Account Heated*		*Triticale, Sample Canada Account Sprouted*

K Number of kernel-sized pieces in 500 g

Export shipments

Export shipments can be commercially clean or not commercially clean. Dockage is not reported for commercially clean shipments.

Commercially clean

Shipments are defined as commercially clean when meeting the commercially clean specifications listed in the export grade determinant table upon following the *Determination of commercially clean* procedures described in this chapter.

No dockage is reported for samples representing commercially clean triticale.

Not commercially clean (NCC)

Shipments that do not meet the standards for commercial cleanliness are referred to as not commercially clean. Such shipments are allowed only with the permission of the CGC.

For samples representing not commercially clean shipments approved by the CGC for shipment from terminal and transfer elevators, dockage is reported to the nearest
- 0.1% for samples representing commercially clean shipments loaded from a single terminal or transfer elevator
- 0.01% for composite samples representing shipments loaded from more than one terminal or transfer elevator

less a deduction of up to 0.2% to take into account the buildup of attritional material.

Grading

Triticale on export is graded according to export specifications.

Export grade determinants tables

Triticale, Canada (CAN)

	Removable material through No. 4.5 round-hole sieve		Foreign material									Damage	
			Seeds and wild oats				Mineral matter						
Grade name	(1) Small seeds %	(2) Total %	Large seeds %	Wild oats %	Total %	Cereal grains other than wheat %	Stones %	Total %	Ergot %	Sclerotinia %	Total foreign material, including wheat %	Sprouted %	Heated %
No. 1 Canada	0.05	0.10	0.2	0.2	0.3	1	**0.033**	**0.066**	4K	4K	**2.5**	0.5	0.05
No. 2 Canada	0.05	0.10	0.4	0.4	0.6	2	**0.033**	0.10	8K	8K	4	2	**0.35**
No. 3 Canada	0.05	0.10	1	1	**1.5**	3	**0.066**	**0.15**	0.1	0.1	7	10	**2.5**

K Number of kernel-sized pieces in 500 g

9. Mixed grain

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Determination of commercially clean

Dockage is not assessed on mixed grain samples that meet the commercially clean specifications defined in the mixed grain export grade determinant table. All samples must be analyzed to determine if they are commercially clean prior to dockage assessment. The analysis of samples which are **clearly** not commercially clean may consist of a visual assessment. For example, if there is no doubt that a sample contains more than 0.1% of small seeds without hand sieving and weighing the seeds then dockage will be assessed using procedures defined under *Determination of dockage*. Where there is any doubt regarding whether the sample is commercially clean the sample must be analyzed using the procedures outlined in steps 1 through 5 below to confirm that the sample is not commercially clean prior to assessing a dockage.

1. Using a Boerner-type divider, divide the sample to obtain a representative portion.
    - Official samples should be at least 900 grams.
    - Unofficial samples must be at least 750 grams.
2. Place approximately 250 grams of the sample at a time on the No. 4.5 round-hole hand sieve.
3. Move the sieves from left to right 30 times using a sifting motion. One complete motion is approximately 10 cm from the center to one side, back to the center, approximately 10 cm to the other side and back to the center.
4. All material passing through the No. 4.5 round-hole sieve is weighed and the percentage calculated to determine if it meets the commercially clean specification of the grade for material removable through the No. 4.5 round hole sieve.
(Column #2 in the mixed grain export grade determinant table)
5. Small seeds passing through the No. 4.5 round hole sieve are weighed and the percentage calculated to determine if they meet the commercially clean specification of the grade for small seeds. (Column #1 in the mixed grain export grade determinant table)

Should the percentage concentration of either of the factors determined in steps 1 through 5 exceed the specifications set out in columns 1 or 2 of the mixed grain export grade determinant table the sample will be considered to be not commercial clean. Dockage will be assessed on samples determined to be not commercially clean by using the procedures defined under *Determination of dockage*.

Determination of dockage

Definitions

Dockage is assessed and recorded to the nearest 0.1%.

Dockage is defined under the Canada Grain Act as "any material intermixed with a parcel of grain, other than kernels of grain of a standard of quality fixed by or under this Act for a grade of that grain, that must and can be separated from the parcel of grain before that grade can be assigned to the grain." Dockage is removed by following the cleaning procedures described in this section of the guide.

The sample as it arrives is referred to as the uncleaned or dirty sample. Its weight is the **gross weight** of the sample. Dockage is assessed on the gross weight of the sample.

Dockage is assessed in two stages.

1. Follow Normal cleaning procedures, using the Carter dockage tester.
2. Follow procedures for Cleaning for grade improvement. This cleaning can be done at any time after normal cleaning has been completed.

Dockage not reported

▲ **Important:** Dockage is not reported for samples grading

- Mixed Grain, Sample CW/CE Account Fireburnt
- Mixed Grain, Sample Salvage
- Mixed Grain, Sample Condemned

Composition of mixed grain

Mixed grain consists of any mixture of wheat, rye, barley, oats, triticale, wild oats and domestic or wild oat groats which is excluded from other established grades on account of such mixtures.

▲ **Important:** When a sample is to be graded as mixed grain, return dockage to the cleaned sample, and begin *Normal cleaning procedures* described in this section.

Normal cleaning procedures

1. Set up the Carter dockage tester as follows:

Feed control	6
Air control	Minimum 4
Riddle	No. 6
Top sieve	No. 6 buckwheat
Centre sieve	No. 5 buckwheat
Bottom sieve	No. 4.5 round-hole
Sieve cleaner control	Off

2. Using a Boerner-type divider, divide the uncleaned sample to obtain a representative portion.
    - Official samples should be at least 900 grams.
    - Unofficial samples should be at least 750 grams.
3. Turn on the Carter dockage tester.
4. Pour the sample into the hopper.
5. After the sample has passed through the machine, turn on the sieve cleaner control for two to three seconds to remove kernels lodged in the sieve.
6. Turn off the dockage tester.
7. Lightly snap the retainer rod of the aspiration pan to loosen material gathered on the air screen.
8. Remove the aspiration pan.
9. Determine dockage, using the list under *Composition of dockage*.

Composition of dockage

Dockage includes

- Material handpicked or removed over the No. 6 riddle
- Lightweight material removed by aspiration
- Material that passes through the No. 4.5 round-hole sieve
- Material such as large seeds removed by the No. 5 buckwheat sieve in excess of the grade tolerence for total foreign material
- A maximum of 10% of soft earth pellets handpicked from the clean sample
- Material removed by *Cleaning for grade improvement*

Cleaning for grade improvement

If the grade of a sample can be improved by additional cleaning, perform the cleaning and add the additional material to dockage. Cleaning for grade improvement can be done at any time.

1. Sieve the sample, using the No. 6 buckwheat hand sieve.

    ▲ **Important:** When you use a hand sieve, move the sieve from left to right 30 times, using a sifting motion. One time is one complete motion from the centre, to one side, to the other side, and back to the centre. The total distance from left to right is 20 cm, or about eight inches.

2. Weigh the additional dockage and add it to the original dockage.

Cleaning for grade improvement

Material to be removed	Equipment	Effect on composition of dockage
Large seeds	No. 6 buckwheat hand sieve	Large seeds are seeds that pass through the No. 6 buckwheat sieve. Add them to dockage.
Stones	No. 6 buckwheat hand sieve	Add all stones that pass through the No. 6 buckwheat sieve to dockage.

Optional analysis

Where a shipper requests special cleaning of a carlot of grain at a terminal or transfer elevator, and the elevator manager agrees, dockage material will be analyzed for the presence of grain. The percentage and grade of any grain contained in the dockage will be reported and elevator stocks will be adjusted on the basis of the analysis. Agreement of the shipper and unload elevator must be conveyed to the CGC in writing prior to the analysis being performed.

Procedures

1. Analyze the official sample.
2. Record the following on inspection records:
   - The percentage by gross weight to the nearest 0.1% and the grade of mixed grain.
   - The percentage by gross weight to the nearest 0.1% and the grade of grain separable from dockage.
   - The percentage of dockage.

Example
95.0% Mixed Grain CW Wheat
4.0% Domestic Mustard Seed, No. 1 CAN Oriental
1.0% dockage

Grading

Important definitions

Net weight of sample

The sample after cleaning and removal of dockage is referred to as the cleaned sample. Its weight is the net weight of the sample. For grading, percentages by weight refer to percentages of the net weight.

Kernel counts (K)

A kernel count is the number of kernel-sized pieces in a 500 gram sample.

- To do kernel counts, you must have 500 grams of cleaned sample.
- All grading is done on representative portions divided down from the cleaned sample using a Boerner-type divider.

Hazardous substances in samples

Wear gloves and a mask to handle any samples that you suspect may contain hazardous substances. Hazardous substances are defined in the Regulations as "any pesticide, herbicide or desiccant."

Representative portion for grading

All grading is done on representative portions divided down from the cleaned sample, using a Boerner-type divider.

When the concentration grading factor is . . .	Then use . . .
Low	optimum portion size
High	minimum portion size or more **(do not use less)**

Values in the table represent a range of recommended portion sizes.

Representative portion of mixed grain for grading, grams

Grading factor	Minimum	Optimum	Export
Broken	25	**50**	50
Ergot	500	**1000**	1000
Excreta	working sample	**working sample**	working sample
Fireburnt	500	**working sample**	working sample
Fusarium damage	25	**100**	100
Heated	25	**100**	100
Large seeds	100	**250**	working sample
Sclerotinia sclerotiorum	500	**1000**	1000
Soft earth pellets	working sample	**working sample**	working sample
Stones	500	**1000**	1000

Grading factors

Broken (BKN)

Broken kernels are pieces of grain that are less than three-quarters of a whole kernel.

Representative portion for analysis

Minimum—25 g	Optimum—50 g	Export—50 g

Contaminated grain

▲ **Important:** Wear gloves and a mask to handle any sample that is suspected of containing contaminated grain.

Contaminated is defined in the *"Canada Grain Act"* as; "Contaminated means, in respect of grain, containing any substance in sufficient quantity that the grain is unfit for consumption by persons or animals or is adulterated within the meaning of the regulations made pursuant to sections B.01.046(1), B.15.001 and B.15.002(1) of the *Food and Drugs Act*."

Samples deemed to be contaminated by the Grain Research Laboratory in consultation with the Chief Grain Inspector for Canada are graded *Mixed Grain, Sample Condemned.*

Earth pellets (EP)

- Hard earth pellets are pellets that do not crumble under light pressure. See *Stones*.
- Soft earth pellets are pellets that crumble under light pressure. See *Soft earth pellets*.

Ergot (ERG)

Ergot is a plant disease producing elongated fungus bodies having a purplish-black exterior, a purplish-white to off white interior, and a relatively smooth surface texture.

Representative portion for analysis

Minimum—500 g	Optimum—1000 g	Export—1000 g

Procedures

- Determine the weight of ergot as a percentage of the net weight of the sample.

Excreta (EXCR)

▲ **Important:** Wear gloves and a mask to handle any samples that you suspect may contain excreta.

Representative portion for analysis

Minimum—working sample	Optimum—working sample	Export—working sample

Fertilizer pellets (FERT PLTS)

Fertilizer pellets are typically either small, round and white or irregular shaped and pink or red. Fertilizer pellets are not considered a hazardous substance however there is no visible means of assuring that material resembling fertilizer pellets is not some other contaminant.

Representative portion for analysis

Minimum—working sample
Optimum—working sample
Export—working sample

Procedures

- Handpick any fertilizer pellets and determine the concentration basis the net working sample.
- Fertilizer pellets are assessed as stones when the concentration does not exceed 1.0% of the net sample weight.
- Samples containing fertilizer pellets in excess of 1.0% of the net sample weight are graded *Mixed Grain, Held IP Suspect Contaminated Grain.*

Note: Canadian Grain Commission personnel should refer to ISO national work instruction "*Suspect Contaminated Grain, Handling Procedures*" for procedures to be followed when handling samples containing fertilizer pellets.

Fireburnt (FBNT)

Fireburnt kernels are kernels charred or scorched by fire. A cross-section of a fireburnt kernel resembles charcoal with numerous air holes. The air holes result in a low weight kernel which crumbles easily under pressure.

Representative portion for analysis

Minimum—500 g
Optimum—working sample
Export—working sample

Heated (HTD)

Heated kernels are kernels having the colour and odour typical of grain that has heated in storage or has been damaged by artificial drying, but not charred kernels. Heated kernels include all heated grains in the sample.

Representative portion for analysis

Minimum—25 g
Optimum—100 g
Export—100 g

Large seeds (LSDS)

Large seeds are seeds that do not pass through the No. 4.5 round-hole sieve and grains other than cereal grains, such as peas, beans, corn, flaxseed and domestic buckwheat. Large seeds remaining in the sample are included in *Total foreign material*.

Representative portion for analysis

Minimum—100 g
Optimum—250 g
Export—working sample

Odour (HTD)

There is no numeric tolerance for odour. Consider

- The basic quality of the sample
- The type and degree of the odour
- The presence of visible residue causing the odour

Representative portion for analysis

Minimum—working sample	Optimum—working sample	Export—working sample

If odour is the grade determinant and there is . . .	Then the grade is
A distinct objectionable odour not associated with the quality of the grain, but not heated or fireburnt	*Mixed grain, Sample CW/CE, Account Odour*
A distinct heated odour	*Mixed grain, Sample CW/CE, Account Heated*
A distinct fireburnt odour	*Mixed grain, Sample CW/CE, Account Fireburnt*

Sclerotinia sclerotiorum (SCL)

Sclerotinia sclerotiorum is a fungus producing hard masses of fungal tissue, called *sclerotia*. The sclerotia vary in size and shape, have a course surface texture, vary in exterior color from dark black to gray to white and have a pure white interior.

Representative portion for analysis

Minimum—500 g	Optimum—1000 g	Export—1000 g

Soft earth pellets (SEP)

Soft earth pellets are

- Earth pellets that crumble into fine dust under light pressure using a finger only—if they do not crumble, they are considered *Stones*
- Any non-toxic material of similar consistency

Representative portion for analysis

Minimum—working sample	Optimum—working sample	Export—working sample

Procedures

1. Handpick soft earth pellets from a representative portion of the cleaned sample.
2. Soft earth pellets constituting 10.0% or less of the sample are assessed as dockage.
3. Where soft earth pellets represent more than 10% of the net weight, the sample is graded *Mixed Grain, Sample CW/CE Account Admixture*.

Stones (STNS)

Stones are hard shale, coal, hard earth pellets, and any other non toxic materials of similar consistency. Fertilizer pellets are assessed as stones when constituting 1.0% or less of the net sample weight. (See *Fertilizer pellets* for specific procedures to be followed when samples contain fertilizer pellets.)

Representative portion for analysis

Minimum—500 g Optimum—1000 g Export—1000 g

Procedures

1. Handpick stones from a representative portion of the cleaned sample.
2. Determine stone concentration in the net sample.

Note: Stones may be removed and included in dockage if the the material removed is 5.0% or less of the gross weight of the sample. See *Cleaning for grade improvement*.

- In western Canada samples of grain containing stones in excess of "basic grade" tolerances, up to 2.5% are graded *Mixed Grain, Rejected "basic grade" Account Stones*. The "*basic grade*" refers to a grade established in the Canada Grain Regulations (grades listed in the first column in grade determinant tables) that would have been assigned to the sample if it contained no stones.
- In eastern Canada samples of grain containing stones in excess of grade tolerances are degraded to lower grades. Samples containing stones in excess of the tolerance of the lowest grade established by regulation up to 2.5% are graded *Mixed Grain, Sample CE Account Stones*.
- In western and eastern Canada grain containing more than 2.5% stones is graded *Mixed Grain, Sample Salvage*.

Examples: Western Canada

Excerpt from grade determinant tables for
Mixed Grain, Canada Western (CW)

Grade name	Stones
Mixed Grain CW Wheat	5K
Mixed Grain CW Rye	5K
Mixed Grain CW Barley	5K
Mixed Grain CW Oats	5K
Mixed Grain CW Triticale	5K
Mixed Grain CW	5K

K Number of kernel-sized pieces in 500 g

Basic grade:......................... *Mixed Grain, CW Wheat*

If the above sample contained	Grade in western Canada
10K stones	*Mixed Grain, Rejected CW Wheat Account Stones*
1.0% stones	*Mixed Grain, Rejected CW Wheat Account Stones*
3.0% stones	*Mixed Grain, Sample Salvage*

Examples: Eastern Canada

Excerpt from grade determinant tables for
Mixed Grain, Canada Eastern (CE)

Grade name	Stones
Mixed Grain CE Wheat	5K
Mixed Grain CE Rye	5K
Mixed Grain CE Barley	5K
Mixed Grain CE Oats	5K
Mixed Grain CE Triticale	5K
Mixed Grain CE	5K

K Number of kernel-sized pieces in 500 g

Basic grade:......................... *Mixed Grain, CE Wheat*

If the above sample contained	Grade in eastern Canada
10K stones	*Mixed Grain, Sample CE Account Stones*
1.0% stones	*Mixed Grain, Sample CE Account Stones*
3.0% stones	*Mixed Grain, Sample Salvage*

Treated seed and other chemical substances

Treated seed

Treated seed is grain that has been coated with an agricultural chemical for agronomic purposes. These seed dressings contain a dye to render the treated seed visually conspicuous. The colour of the dye varies depending upon the type of treatment and the type of grain. The current Canadian colour standards for pesticide seed treatments are: cereals–pink or red, canola–baby blue or green. Seed treated with an inoculant may have a green stain. The coatings or stains may appear greasy or powdery and surface area distribution ranges from tiny flecks to complete coverage.

Other chemical substances

Other chemical substances refers to any chemical residues either adhering to the kernel or remaining in the sample and to samples having a chemical odour of any kind.

▲ **Important:** Wear gloves and a mask to handle any samples that you suspect may contain contaminated grain.

Representative portion for analysis

Minimum—working sample	Optimum—working sample	Export—working sample

If a sample is suspected of being coated with a pesticide, desiccant, inoculant or if the sample contains evidence of any foreign chemical substance other than fertilizer pellets, the sample shall be graded *Mixed grain, Held IP Suspect Contaminated Grain*.

Note: Canadian Grain Commission personnel should refer to ISO national work instruction "*Suspect Contaminated Grain, Handling Procedures*" for specific procedures to be followed when handling samples suspected of containing treated seed or other chemical substances.

Primary grade determinants tables

Mixed Grain, Canada Western (CW)

Grade name	** Composition
Mixed Grain CW Wheat	Mixtures of cereal grains and wild oats, wheat predominating
Mixed Grain CW Rye	Mixtures of cereal grains and wild oats, rye predominating
Mixed Grain CW Barley	Mixtures of cereal grains and wild oats, barley predominating
Mixed Grain CW Oats	Mixtures of cereal grains and wild oats, oats predominating
Mixed Grain CW Triticale	Mixtures of cereal grains and wild oats, triticale predominating
Mixed Grain CW	Mixtures of cereal grains and wild oats, no single grain predominating

	Damage			Foreign material				
Grade name	Broken %	Fireburnt %	Heated %	Ergot %	Excreta %	Sclerotinia %	Stones	Total %
Mixed Grain CW Wheat	20	0.5	10	0.1	0.02	**0.25**	5K	2
Mixed Grain CW Rye	20	0.5	10	0.1	0.02	**0.25**	5K	2
Mixed Grain CW Barley	20	0.5	10	0.1	0.02	**0.25**	5K	2
Mixed Grain CW Oats	20	0.5	10	0.1	0.02	**0.25**	5K	2
Mixed Grain CW Triticale	20	0.5	10	0.1	0.02	**0.25**	5K	2
Mixed Grain CW	20	0.5	10	0.1	0.02	**0.25**	5K	2
Grade, if specs for Mixed Grain not met	50% or less– *Sample Feed Grain* Over 50%– *Sample Broken Grain*	*Mixed Grain, Sample CW Account Fireburnt*	*Mixed Grain, Sample CW Account Heated*	*Mixed Grain, Sample CW Account Ergot*	*Mixed Grain, Sample CW Account Excreta*	*Mixed Grain, Sample CW Account Admixture*	2.5% or less– *Mixed Grain, Rejected (grade) Account Stones* Over 2.5%– *Mixed Grain, Sample Salvage*	*Mixed Grain, Sample CW Account Admixture*

** All grades must have less than 50% by weight of wild oats

K Number of kernel-sized pieces in 500 grams

Mixed Grain, Canada Eastern (CE)

Grade name	** Composition
Mixed Grain CE Wheat	Mixtures of cereal grains and wild oats, wheat predominating
Mixed Grain CE Rye	Mixtures of cereal grains and wild oats, rye predominating
Mixed Grain CE Barley	Mixtures of cereal grains and wild oats, barley predominating
Mixed Grain CE Oats	Mixtures of cereal grains and wild oats, oats predominating
Mixed Grain CE Triticale	Mixtures of cereal grains and wild oats, triticale predominating
Mixed Grain CE	Mixtures of cereal grains and wild oats, no single grain predominating

	Damage			**Foreign material**				
Grade name	**Broken %**	**Fireburnt %**	**Heated %**	**Ergot %**	**Excreta %**	**Sclerotinia %**	**Stones**	**Total %**
Mixed Grain CE Wheat	20	0.5	10	0.25	0.02	0.25	5K	2
Mixed Grain CE Rye	20	0.5	10	0.25	0.02	0.25	5K	2
Mixed Grain CE Barley	20	0.5	10	0.25	0.02	0.25	5K	2
Mixed Grain CE Oats	20	0.5	10	0.25	0.02	0.25	5K	2
Mixed Grain CE Triticale	20	0.5	10	0.25	0.02	0.25	5K	2
Mixed Grain CE	20	0.5	10	0.25	0.02	0.25	5K	2
Grade, if specs for Mixed Grain not met	50% or less– *Sample Feed Grain* Over 50%– *Sample Broken Grain*	*Mixed Grain, Sample CE Account Fireburnt*	*Mixed Grain, Sample CE Account Heated*	*Mixed Grain, Sample CE Account Ergot*	*Mixed Grain, Sample CE Account Excreta*	*Mixed Grain, Sample CE Account Admixture*	2.5% or less– *Mixed Grain, Rejected (grade) Account Stones* Over 2.5%– *Mixed Grain, Sample Salvage*	*Mixed Grain, Sample CE Account Admixture*

** All grades must have less than 50.0% by weight of wild oats

K Number of kernel-sized pieces in 500 grams

Export shipments

Shipments can be commercially clean or not commercially clean. Dockage is not reported for commercially clean shipments

Commercially clean

Shipments are defined as commercially clean when meeting the commercially clean specifications listed in the export grade determinant table upon following the *Determination of commercially clean* procedures described in this chapter.

No dockage is reported for samples representing commercially clean mixed grain.

Not commercially clean (NCC)

Shipments that do not meet the standards for commercial cleanliness are referred to as not commercially clean. Such shipments are allowed only with the permission of the CGC.

For samples representing not commercially clean shipments approved by the CGC for shipment from terminal and transfer elevators, dockage is reported to the nearest

- 0.1% for samples representing commercially clean shipments loaded from a single terminal or transfer elevator
- 0.01% for composite samples representing shipments loaded from more than one terminal or transfer elevator

less a deduction of up to 0.2% to take into account the buildup of attritional material.

Grading

Mixed grain on export is graded in accordance with export specifications. Where there is no export specification the primary specification and procedures are used. The composition of samples is shown on all records and endorsed on the backs of certificates.

Export grade determinants tables

Mixed Grain, Canada Western/Canada Eastern (CW/CE)

	Foreign material other than cereal grains and wild oats						
	Material through #4.5 round-hole sieve						
Grade name	(1) Small seeds %	(2) Total %	Ergot %	Sclerotinia %	Stones	Total %	Heated %
Mixed Grain CW/CE Wheat	0.10	0.2	0.1	0.25	5K	2	10
Mixed Grain CW/CE Rye	0.10	0.2	0.1	0.25	5K	2	10
Mixed Grain CW/CE Barley	0.10	0.2	0.1	0.25	5K	2	10
Mixed Grain CW/CE Oats	0.10	0.2	0.1	0.25	5K	2	10
Mixed Grain CW/CE Triticale	0.10	0.2	0.1	0.25	5K	2	10
Mixed Grain CW/CE	0.10	0.2	0.1	0.25	5K	2	10

K Number of kernel-sized pieces in 500 grams

The area inside dashed lines refers to factors which are assessed in determining commercial cleanliness.

10. Canola and rapeseed

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Classes and varieties

Canola and rapeseed are classes of the same botanical family.

This chapter describes dockage and grading procedures for canola and rapeseed. Canola has been used in the examples of grade names. If a sample of rapeseed is submitted for inspection, replace *Canola* with *Rapeseed.*

▲ **Important:** Ensure you use the correct grain code. Codes are different for canola and rapeseed.

Canola

The term canola applies to varieties that meet the canola standards for low levels of erucic acid and glucosinolates. Production of canola varieties is widespread.

Rapeseed

Rapeseed varieties are produced in small volumes, usually under contract. Shipments and submitted samples of rapeseed must be clearly identified as rapeseed.

▲ **Important:** Canola and rapeseed may be visually indistinguishable. However, their end uses are quite different. If you are not sure if the sample is canola or rapeseed, send the sample to the Chief Grain Inspector.

Determination of dockage

Definitions

Dockage is assessed and recorded to the nearest 0.1%.

Dockage is defined under the Canada Grain Act as "any material intermixed with a parcel of grain, other than kernels of grain of a standard of quality fixed by or under this Act for a grade of that grain, that must and can be separated from the parcel of grain before that grade can be assigned to the grain." Dockage is removed by following the cleaning procedures described in this section of the manual.

The sample as it arrives is referred to as the uncleaned or dirty sample. Its weight is the **gross weight** of the sample. Dockage is assessed on the gross weight of the sample.

Dockage is assessed in two stages.

1. Follow *Normal cleaning procedures*, using the Carter dockage tester.
2. Follow procedures for *Cleaning for grade improvement*. This cleaning can be done at any time after normal cleaning has been completed.

Dockage not reported

▲ **Important:** Dockage is not reported for samples grading

- *Canola, Sample Canada Account Fireburnt*
- *Canola, Sample Salvage*
- *Canola, Sample Condemned*

Normal cleaning procedures

▲ **Important:** Wear gloves and a mask to handle any sample which you suspect may contain hazardous substances.

1. Set up the Carter dockage tester as follows:

Feed control	# 3
Air control	# 5
Riddle	No. 000
Top sieve	Blank tray
Centre sieve	None
Bottom sieve	None
Sieve cleaner	Off

2. You also need the following hand sieves:

Round-hole sieves	Slotted sieves
No. 5	No. .028
No. 5.5	No. .032
No. 6	No. .035
No. 6.5	No. .038
No. 7	No. .040
No. 7.5	

3. Using a Boerner-type divider, divide the uncleaned sample to obtain a representative portion.
   - Official samples should be at least 900 g.
   - Unofficial samples should be at least 750 g.

4. For hand sieving use approximately 250 g.

   ▲ **Important**:

   - Ensure you start with the right sized sieves.
   - When you use a hand sieve, move the sieve from left to right 30 times, using a sifting motion. One time is one complete motion from the centre to one side, to the other side, and back to the centre. The total distance from left to right is 20 cm, or about eight inches.

   1. Use whichever round-hole sieve will achieve maximum removal of large material with minimum loss of canola. Nest the round-hole sieve over the slotted sieve.
   2. Use whichever slotted sieve will reduce the admixture of conspicuous inseparable material to within the grade tolerance with a minimum loss of reasonably sound canola.

5. Combine the separated, cleaned 250-g portions.
6. Turn on the Carter dockage tester.
7. Run the entire working sample through the Carter dockage tester for aspiration only.
8. Using a Boerner-type divider, divide the sample to a portion of not less than 10 g.
9. Analyse the 10-g portion to determine the percentage by weight of inseparable foreign material.
10. Determine the dockage, using the list under *Composition of dockage*.

Composition of dockage

Dockage includes

- Material that remains on top of the round-hole sieve
- Material that passes through the slotted sieve
- Material removed by aspiration
- Material that passes over the No. 000 riddle
- Inseparable material, up to established grade tolerances, handpicked from the cleaned sample

  —In *Canola, Rejected (grade) Account Stones,* dockage includes inseparable material handpicked from the cleaned sample up to the tolerance for the grade of the sample.

  —In *Sample* grades, inseparable material is not included as dockage. When the weight of the inseparable admixture exceeds 2.0% of the net weight, the admixture becomes a second reason for the sample grade. This is recorded in Remarks.

- Soft earth pellets handpicked from the cleaned sample
- Material removed by *Cleaning for grade improvement*

Primary samples, commercially clean

Commercially clean primary samples can have up to 0.5% for broken and reasonably sound canola or rapeseed deducted from the gross weight of the dockage. For a definition of commercially clean, see *Export shipments.*

Primary samples, not commercially clean

In not commercially clean primary samples, there is no allowance for broken and reasonably sound canola or rapeseed. All the material removed by the slotted sieve is assessed as dockage.

Cleaning for grade improvement

If the grade of a delivery can be improved by additional cleaning, perform the cleaning and add the additional material to dockage. Cleaning for grade improvement can be done at any time after normal cleaning.

1. After normal cleaning, examine the material to be removed and select your equipment according to the material you want to remove. See the table *Cleaning for grade improvement—Canola* for the list of equipment.
2. Sieve the sample by hand or pass it through the Carter dockage tester, depending on the material.

   ▲ **Important:** When you use a hand sieve, move the sieve from left to right 30 times, using a sifting motion. One time is one complete motion from the centre, to one side, to the other side, and back to the centre. The total distance from left to right is 20 cm, or about eight inches.

3. Weigh the additional dockage and add it to the original dockage.

Cleaning for grade improvement—Canola

Material to be removed	Equipment	Effect on composition of dockage
Weed seeds	Carter dockage tester with air setting at #7, or approved sieves	Weed seeds are added to dockage. Not more than 5.0% of sound canola may be removed for each single grade improvement achieved.
Damaged seeds	Carter dockage tester with air setting at #7, or approved sieves	Weed seeds are added to dockage. Not more than 5.0% of sound canola may be removed for each single grade improvement achieved.

Cleaning sample grade canola

For canola that qualifies only for *Sample Canada, Account Admixture* after cleaning for grade improvement, dockage is assessed using the No. .035 slotted sieve, the round-hole sieve appropriate for the admixture, and the Carter dockage tester with air control set at #5.

For canola that qualifies only for *Sample Canada, Account Damaged* after cleaning for grade improvement, dockage is assessed using the appropriate round-hole and slotted sieves and the Carter dockage tester with air control set at #5. Use the slotted sieve appropriate for removing material consisting mainly of weed seeds and small broken grain. Also consider the maximum tolerance for inseparable admixture for these samples.

▲ **Important:** Variations from the above settings require authority from the Chief Grain Inspector.

Optional analysis

Where a shipper requests special cleaning of a carlot of grain at a terminal or transfer elevator, and the elevator manager agrees, dockage material will be analyzed for the presence of grain. The percentage and grade of any grain contained in the dockage will be reported and elevator stocks will be adjusted on the basis of the analysis. Agreement of the shipper and unload elevator must be conveyed to the CGC in writing prior to the analysis being performed.

Procedures

1. Analyze the official sample.
2. Record the following on inspection records:
   - The percentage by gross weight to the nearest 0.1% and the grade of canola.
   - The percentage by gross weight to the nearest 0.1% and the grade of grain separable from dockage.
   - The percentage of dockage.

   Example
   95.0% Canola, No. 1 CAN
   4.0% Barley, No. 1 CW
   1.0% dockage

Grading

Important definitions

Net weight of sample

The sample after cleaning and removal of dockage is referred to as the cleaned sample. Its weight is the net weight of the sample. Percentages by weight for grading refer to percentages of the cleaned sample, or the net weight.

Hazardous substances in samples

Wear gloves and a mask to handle any samples that you suspect may contain hazardous substances. Hazardous substances are defined in the Regulations as "any pesticide, herbicide or desiccant."

Crush

A crush is one pass of the roller under firm pressure over a 100-seed stick on masking tape.

Representative portion for grading

All grading is done on representative portions divided down from the cleaned sample, using a Boerner-type divider.

When the concentration of the grading factor is . . .	Then use . . .
Low	Optimum portion size
High	Minimum portion size or more **(do not use less)**

Values in this table represent a range of recommended portions of samples for grading.

Representative portion of canola or rapeseed for grading, grams

Grading factor	Minimum	Optimum	Export
Conspicuous admixture	10	**25**	25
Damage	5	**10**	10
Distinctly green	5 crushes	**10 crushes**	10 crushes
Ergot	100	**500**	500
Excreta	working sample	**working sample**	working sample
Fireburnt	500	**working sample**	working sample
Heated	5 crushes	**10 crushes**	10 crushes
Inconspicuous admixture	1	**5**	5
Insect excreta	100	**500**	500
Odour	working sample	**working sample**	working sample
Rime	5	**25**	25
Sclerotinia sclerotiorum	100	**500**	500
Soft earth pellets	working sample	**working sample**	working sample
Staghead	10	**25**	25
Stones	100	**working sample**	working sample

Grading factors

Broken (BKN)

Any broken canola that remains in the sample after cleaning and is otherwise sound is considered to be sound.

Colour (CLR)

In assessing colour, consider

- The amount and degree of discolouration of the whole seed, such as from weathering
- The amount of rime (seeds densely and completely covered by rime are assessed as *Damage*)
- The proportion of crushed seeds which are only pale green or slightly immature and therefore not assessed as distinctly green

Note: Whole seeds that are green may be as a result of thin seed coats of certain canola varieties. Whole green seeds of these varieties are not indicators of elevated chlorophyll levels and therefore are not considered distinctly green or assessed as part of colour evaluation. Only seeds which are distinctly green throughout when crushed are assessed as distinctly green.

▲ **Important**: Where colour is the grade determinant, use the description under *Degree of soundness* in the *Primary grade determinants* table to assign the grade.

Conspicuous admixture (CADMX)

Conspicuous admixture refers to seeds that remain in the sample after cleaning and are easily distinguished from canola without the use of magnification, including

- Domestic seeds such as flaxseed, yellow mustard, whole shrunken or broken kernels of other grains
- Weed seeds such as cow cockle, lamb's-quarters, cleavers, smartweed, ball mustard and pigweed.

Representative portion for analysis

Minimum—10 g Optimum—25 g Export—25 g

Contaminated grain

▲ **Important:** Wear gloves and a mask to handle any sample that is suspected of containing contaminated grain.

Contaminated is defined in the *"Canada Grain Act"* as; "Contaminated means, in respect of grain, containing any substance in sufficient quantity that the grain is unfit for consumption by persons or animals or is adulterated within the meaning of the regulations made pursuant to sections B.01.046(1), B.15.001 and B.15.002(1) of the *Food and Drugs Act*."

Samples deemed to be contaminated by the Grain Research Laboratory in consultation with the Chief Grain Inspector for Canada are graded *Canola, Sample Condemned.*

Damage (DMG)

Damage in canola includes seeds that are

- Distinctly shrunken or shriveled
- Badly discoloured from mould
- Completely and densely covered with rime
- Excessively weathered, sprouted, tan coloured, distinctly green, heated, insect damaged or otherwise damaged

Total damage is the total of damaged crushed seeds and any visually damaged uncrushed seeds.

Representative portion for analysis of uncrushed visually damaged seed.

Minimum—5 g	Optimum—10 g	Export—10 g

Procedures

1. Divide the sample to the appropriate representative portion.
2. Handpick the representative portion for visually damaged seeds.
3. Determine the percentage concentration by weight.

Note: See distinctly green and heated for procedures to be followed in assessing these types of damage.

Distinctly green (DGR)

Distinctly green tolerances are applied to crushed seeds which are a distinct green throughout. Pale green or immature seeds are taken into account in the evaluation of colour. See *Colour*.

Number of crushes (100-seed strips) for analysis

Minimum—5	Optimum—10	Export—10

Procedures

1. Prepare and crush the appropriate number of strips from the cleaned sample.
2. A crush is made with one pass of the roller under firm pressure.
3. Determine the percentage of distinctly green seeds.

Earth pellets (EP)

- Hard earth pellets are pellets that do not crumble under light pressure. See *Stones*.
- Soft earth pellets are pellets that crumble under light pressure. See *Soft earth pellets*.

Ergot (ERG)

Ergot is a plant disease producing elongated fungus bodies with a purplish-black exterior, a purplish-white to off white interior, and a relatively smooth surface texture.

Representative portion for analysis

Minimum—100 g
Optimum—500 g
Export—500 g

Excreta (EXCR)

▲ **Important:** Wear gloves and a mask to handle any samples that you suspect may contain excreta.

There is a separate tolerance for insect excreta in canola.

Representative portion for analysis

Minimum—working sample
Optimum—working sample
Export—working sample

Fertilizer pellets (FERT PLTS)

Fertilizer pellets are typically either small, round and white or irregular shaped and pink or red. Fertilizer pellets are not considered a hazardous substance however there is no visible means of assuring that material resembling fertilizer pellets is not some other contaminant.

Representative portion for analysis

Minimum—working sample
Optimum—working sample
Export—working sample

Procedures

- Handpick any fertilizer pellets and determine the concentration basis the net working sample.
- Fertilizer pellets are assessed as stones when the concentration does not exceed 1.0% of the net sample weight.
- Samples containing fertilizer pellets in excess of 1.0% of the net sample weight are graded *Canola, Held IP Suspect Contaminated Grain.*

Note: Canadian Grain Commission personnel should refer to ISO national work instruction "*Suspect Contaminated Grain, Handling Procedures*" for procedures to be followed when handling samples containing fertilizer pellets.

Fireburnt (FBNT)

Samples that show any evidence of being charred or scorched by fire are considered fireburnt. Evidence includes odour, pieces of charred wood, and so on. Fireburnt seeds pop when crushed.

Representative portion for analysis

Minimum	Optimum	Export
500 g	working sample	working sample

Procedures

Samples considered fireburnt are graded Canola, Sample Canada, Account Fireburnt

Foreign material (FM)

Foreign material in canola includes anything that is not canola, such as stones, ergot, sclerotinia, conspicuous admixture and inconspicuous admixture.

Green

See *Distinctly green*.

Heated (HTD)

Heated refers only to seeds that are distinctly or badly binburnt. Heated seeds may have a heated odour.

Crushed seeds may be

- Black—badly binburnt
- Dark chocolate brown—distinctly heated
- Light tan—slightly damaged from oxidation. If they have an odour or are present with brown or black crushed seeds, they are considered heated. Otherwise, they are included in *Total damage*, not heated.

Number of crushes (100-seed strips) for analysis

Minimum	Optimum	Export
5 (10 when any indication of heating is detected)	10	10

Procedures

1. Prepare and examine the appropriate number of strips from the cleaned sample.
2. A crush is made with one pass of the roller under firm pressure.
3. Examine the crushed seeds for evidence of heating.
4. Where any heated seeds are found in the initial 5 strips or a heated odour is detected a minimum of 10 strips must be analyzed.
5. Determine the percentage of heated seeds.

Inconspicuous admixture (INC ADMX)

Inconspicuous admixture is defined as seeds of common wild mustard, domestic oriental mustard and domestic brown mustard that are not readily distinguishable from canola.

Representative portion for analysis

Minimum—1 g	Optimum—5 g	Export—5 g

Procedures

To determine the percentage by weight of inconspicuous admixture, analyse the sample with the aid of a microscope.

Insect excreta (I EXCR)

▲ **Important:** Wear gloves and a mask to handle any samples that you suspect may contain excreta.

Representative portion for analysis

Minimum—100 g	Optimum—500 g	Export—500 g

Odour (ODOR)

There is no numeric tolerance for odour. Consider

- The basic quality of the sample
- The type and degree of the odour
- The presence of visible residue causing the odour

Representative portion for analysis

Minimum—working sample	Optimum—working sample	Export—working sample

If odour is the grade determinant and there is . . .	Then the grade is . . .
A distinct objectionable odour not associated with the quality of the grain, but not heated or fireburnt	*Canola, Sample Canada, Account Odour*
A distinct heated odour	*Canola, Sample Canada, Account Heated*
A distinct fireburnt odour	*Canola, Sample Canada, Account Fireburnt*

Rime

Rime is the lining of the pod adhered to the seed. Seeds that are completely and densely covered with white rime are classed as damaged in any grade. Seeds with light rime sparsely covering the seed coat are

- Classed as sound if not otherwise damaged
- Considered in the evaluation of colour. See *Colour*

Representative portion for analysis

Minimum—5 g	Optimum—25 g	Export—25 g

Procedures

See *Damage*.

Sclerotinia sclerotiorum (SCL)

Sclerotinia sclerotiorum is a fungus producing hard masses of fungal tissue, called *sclerotia*. The sclerotia vary in size and shape, have a course surface texture, vary in exterior color from dark black to gray to white and have a pure white interior.

Representative portion for analysis

Minimum	Optimum	Export
Minimum—100 g	Optimum—500 g	Export—500 g

Soft earth pellets (SEP)

Soft earth pellets are

- Earth pellets that crumble into fine dust under light pressure, using a finger only—if they do not crumble, they are considered *Stones*
- Any non-toxic material of similar consistency

Representative portion for analysis

Minimum	Optimum	Export
Minimum—working sample	Optimum—working sample	Export—working sample

Procedures

1. Handpick soft earth pellets from a representative portion of the cleaned sample.
2. Soft earth pellets are removed as dockage. See *Composition of dockage.*

Sprouted (SPTD)

Sprouted canola is defined as those seeds having a ruptured seed coat in combination with either a rootlet that protrudes beyond the normal contour of the seed or distinct swelling of the seed. Seeds having a ruptured seed coat that are otherwise sound are only considered sprouted when found in combination with seeds meeting the definition of sprouted.

Representative portion for analysis of uncrushed visually damaged seed.

Minimum	Optimum	Export
Minimum—5 g	Optimum—10 g	Export—10 g

Procedures

1. Divide the sample to the appropriate representative portion.
2. Handpick the representative portion for sprouted seeds.
3. Determine the percentage by weight.

Note: Sprouted canola is included in "Total Damage" for grade assessment.

Staghead

Staghead or white rust is a fungal disease of canola. It affects the flowering parts of the plant, resulting in distorted antler-like structures that are often covered by white or grey powdery spores. For grading, staghead bodies are considered *Conspicuous admixture*.

Representative portion for analysis

Minimum	Optimum	Export
Minimum—10 g	Optimum—25 g	Export—25 g

Stones (STNS)

Stones are hard shale, coal, hard earth pellets, and any other non toxic materials of similar consistency. Fertilizer pellets are assessed as stones when constituting 1.0% or less of the net sample weight. (See *Fertilizer pellets* for specific procedures to be followed when samples contain fertilizer pellets.)

Representative portion for analysis

Minimum—500 g	Optimum—1000 g	Export—1000 g

Procedures

1. Handpick stones from a representative portion of the cleaned sample.
2. Determine stone concentration in the net sample.

- In western Canada samples of grain containing stones in excess of "basic grade" tolerances, up to 2.5% are graded *Canola, Rejected "basic grade" Account Stones*. The "*basic grade*" refers to a grade established in the Canada Grain Regulations (grades listed in the first column in grade determinant tables) that would have been assigned to the sample if it contained no stones.
- In eastern Canada samples of grain containing stones in excess of grade tolerances are degraded to lower grades. Samples containing stones in excess of the tolerance of the lowest grade established by regulation up to 2.5% are graded *Canola, Sample Canada Account Stones.*
- In western and eastern Canada grain containing more than 2.5% stones is graded *Canola, Sample Salvage.*

Examples: Western Canada

Excerpt from grade determinant tables for
Canola, Canada (CAN)

Grade name	Stones %
No. 1 Canada	0.05
No. 2 Canada	0.05
No. 3 Canada	0.05

Basic grade:......................... *Canola, No. 2 Canada*
Reason for basic grade:....... 4.0% Distinctly Green

If the above sample contained	Grade in western Canada
0.08% stones	*Canola, Rejected No. 2 Canada Account Stones*
3.0% stones	*Canola, Sample Salvage*

Examples: Eastern Canada

Excerpt from grade determinant tables for
Canola, Canada (CAN)

Grade name	Stones %
No. 1 Canada	0.05
No. 2 Canada	0.05
No. 3 Canada	0.05

Basic grade:......................... *Canola, No. 2 Canada*
Reason for basic grade:....... 4.0% Distinctly Green

If the above sample contained	Grade in eastern Canada
0.08% stones	*Canola, Sample Canada Account Stones*
3.0% stones	*Canola, Sample Salvage*

Treated seed and other chemical substances

Treated seed

Treated seed is grain that has been coated with an agricultural chemical for agronomic purposes. These seed dressings contain a dye to render the treated seed visually conspicuous. The colour of the dye varies depending upon the type of treatment and the type of grain. The current Canadian colour standards for pesticide seed treatments are: cereals–pink or red, canola–baby blue or green. Seed treated with an inoculant may have a green stain. The coatings or stains may appear greasy or powdery and surface area distribution ranges from tiny flecks to complete coverage.

Other chemical substances

Other chemical substances refers to any chemical residues either adhering to the kernel or remaining in the sample and to samples having a chemical odour of any kind.

▲ **Important:** Wear gloves and a mask to handle any samples that you suspect may contain contaminated grain.

Representative portion for analysis

Minimum—working sample	Optimum—working sample	Export—working sample

If a sample is suspected of being coated with a pesticide, desiccant, inoculant or if the sample contains evidence of any foreign chemical substance other than fertilizer pellets, the sample shall be graded *Canola, Held IP Suspect Contaminated Grain*.

Note: Canadian Grain Commission personnel should refer to ISO national work instruction "*Suspect Contaminated Grain, Handling Procedures*" for specific procedures to be followed when handling samples suspected of containing treated seed or other chemical substances.

Primary grade determinants tables

Canola, Canada (CAN)

	Standard of quality	Standard of cleanliness Commercially pure seed
Grade name	**Degree of soundness**	
No. 1 Canada	Reasonably well matured, sweet, good natural colour	Not more than 1.0% of other seeds that are conspicuous and that are not readily separable from canola, to be assessed as dockage
No. 2 Canada	Fairly well matured, sweet, reasonably good natural colour	Not more than 1.5% of other seeds that are conspicuous and that are not readily separable from canola, to be assessed as dockage
No. 3 Canada	May have the natural odour associated with low-quality seed, not distinctly sour, musty, rancid, or any odour that would indicate serious deterioration	Not more than 2% of other seeds that are conspicuous and that are not readily separable from canola, to be assessed as dockage
Grade, if No. 3 specs not met		*Canola, Sample Canada Account Admixture*

	Damage			Foreign material						
Grade name	**Distinctly green %**	**Heated %**	**Total %**	**Ergot %**	**Excreta %**	**Insect excreta %**	**Sclerotinia %**	**Stones %**	**Conspicuous admixture %**	**Inconspicuous admixture %**
No. 1 Canada	2	0.1	5	0.05	0.02	0.10	0.05	0.05	1.0	5
No. 2 Canada	6	0.5	12	0.05	0.02	0.20	0.10	0.05	1.5	5
No. 3 Canada	20	2	25	0.05	0.02	0.3	**0.15**	0.05	2	5
Grade, if No. 3 specs not met	*Canola, Sample Canada Account Damaged*	*Canola, Sample Canada Account Heated*	*Canola, Sample Canada Account Damaged*	*Canola, Sample Canada Account Ergot*	*Canola, Sample Canada Account Excreta*	*Canola, Sample Canada Account Excreta*	*Canola, Sample Canada Account Admixture*	2.5% or less—*Canola, Rejected (grade) Account Stones*, or *Canola, Sample Canada Account Stones* Over 2.5%—*Canola, Sample Salvage*	*Canola, Sample Canada Account Admixture*	50% or less—*Canola, Sample Canada Account Admixture* Over 50%—*Refuse screenings*

Rapeseed, Canada (CAN)

Grade name	Standard of quality	Standard of cleanliness Commercially pure seed
	Degree of soundness	
No. 1 Canada	Reasonably well matured, sweet, good natural colour	Not more than 1.0% of other seeds that are conspicuous and that are not readily separable from rapeseed
No. 2 Canada	Fairly well matured, sweet, reasonably good natural colour	Not more than 1.5% of other seeds that are conspicuous and that are not readily separable from rapeseed
No. 3 Canada	May have the natural odour associated with low-quality seed, not distinctly sour, musty, rancid, or any odour that would indicate serious deterioration	Not more than 2% of other seeds that are conspicuous and that are not readily separable from rapeseed
Grade, if No. 3 specs not met		*Rapeseed, Sample Canada Account Admixture*

Grade name	Damage			Foreign material						
	Distinctly green %	**Heated %**	**Total %**	**Ergot %**	**Excreta %**	**Insect excreta %**	**Sclerotinia %**	**Stones %**	**Conspicuous admixture %**	**Inconspicuous admixture %**
No. 1 Canada	2	0.1	5	0.05	0.02	0.10	0.05	0.05	1.0	5
No. 2 Canada	6	0.5	12	0.05	0.02	0.20	0.10	0.05	1.5	5
No. 3 Canada	20	2	25	0.05	0.02	0.3	**0.15**	0.05	2	5
Grade, if No. 3 specs not met	*Rapeseed, Sample Canada Account Damaged*	*Rapeseed, Sample Canada Account Heated*	*Rapeseed Sample Canada Account Damaged*	*Rapeseed, Sample Canada Account Ergot*	*Rapeseed, Sample Canada Account Excreta*	*Rapeseed, Sample Canada Account Excreta*	*Rapeseed, Sample Canada Account Admixture*	2.5% or less— *Rapeseed, Rejected (grade) Account Stones*, or *Canola, Sample Canada Account Stones* Over 2.5%— *Rapeseed, Sample Salvage*	*Rapeseed, Sample Canada Account Admixture*	50% or less— *Rapeseed, Sample Canada Account Admixture* Over 50%—*Refuse screenings*

Export shipments

Export shipments can be commercially clean or not commercially clean.

Commercially clean

Shipments defined as commercially clean may contain material as follows.

Definition of commercial cleanliness, canola

Grade name	Material remaining on top of round-hole sieve, including coarse grains % Roughage material such as wild oats, seed pods, knuckles	Total	Total net dockage %
No. 1 Canada	0.2	0.5	2.5
No. 2 Canada	0.2	0.5	2.5
No. 3 Canada	0.2	0.5	2.5

Dockage is reported to the nearest

- 0.1% for samples representing commercially clean shipments loaded from a single terminal or transfer elevator
- 0.01% for composite samples representing shipments loaded from more than one terminal or transfer elevator

A deduction for broken and reasonably sound canola handpicked from the material and removed as dockage is allowed

- On shipments not for direct export, of up to 0.50%
- On shipments for direct export, of up to 0.75%

These deductions are applied to determine total net dockage for commercially clean shipments.

Not commercially clean (NCC)

Shipments that do not meet the standards for commercial cleanliness are referred to as *not commercially clean.* Such shipments are allowed only with he permission of the CGC.

For samples representing not commercially clean shipments approved by the CGC for shipment from terminal and transfer elevators, dockage is reported to the nearest

- 0.1% for samples representing commercially clean shipments loaded from a single terminal or transfer elevator
- 0.01% for composite samples representing shipments loaded from more than one terminal or transfer elevator

Instead of the allowances for broken seed in commercially clean shipments, a direct deduction of up to 0.2% is applied to establish net dockage.

Determination of dockage

Follow procedures for normal cleaning, with the Carter dockage tester set up as follows:

Feed control	#3
Air control	#5
Riddle	No. 000
Top sieve	Blank tray
Centre sieve	None
Bottom sieve	None
Sieve cleaner	Off

You will also need the following hand sieves.

Round-hole sieves	Slotted sieves
No. 5	No. .028
No. 5.5	No. .032
No. 6	
No. 6.5	
No. 7	
No. 7.5	

Composition of dockage

In export grade canola, dockage consists of

- Material other than canola that passes over the No. 000 riddle or remains on top of the round-hole sieve
- Material that passes through the No. 028 or .032 slotted sieve, less the applicable allowance of broken and reasonably sound canola
- Material removed by aspiration
- *Conspicuous admixture* handpicked from the cleaned sample

Grading

Canola on export is graded in accordance with export specifications. Where there are no export specifications, the primary specifications are used.

Export grade determinants tables

Canola and rapeseed, Canada (CAN)

Grade name	Total removable material %	Damage			Foreign material					Inconspicuous admixture %
		Distinctly green %	Heated %	Total %	Ergot %	Insect excreta %	Sclerotinia %	Stones %	Conspicuous admixture %	
No. 1 Canada	2.5	2	0.1	5	0.05	0.10	0.05	0.05	1.0	5
No. 2 Canada	2.5	6	0.5	12	0.05	0.20	0.10	0.05	1.5	5
No. 3 Canada	2.5	20	2	25	0.05	0.3	**0.15**	0.05	2	5

11. Flaxseed and solin

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Classes and varieties

Flaxseed and solin are classes of the same botanical family.

This section describes dockage and grading procedures for flaxseed and solin. Flaxseed has been used in the examples of grade names, and throughout the section. All procedures and grading factors, however, apply to solin as well.

▲ **Important:** Ensure you use the correct grain code. Codes are different for flaxseed and solin.

Flaxseed

Flaxseed applies to varieties with brown seed coats. Golden flaxseed, has a yellow seed coat.

Solin

Solin refers to varieties with yellow seed coats and which meet solin standards for low linolenic acid content of less than 5%.

▲ **Important:** Golden flaxseed and solin may be visually indistinguishable. Their end uses, however, are very different and samples should be correctly identified. If you are not sure whether a sample is flaxseed or solin, send the sample to the Chief Grain Inspector.

Determination of dockage

Definitions

Dockage is assessed and recorded to the nearest 0.1%.

Dockage is defined under the Canada Grain Act as "any material intermixed with a parcel of grain, other than kernels of grain of a standard of quality fixed by or under this Act for a grade of that grain, that must and can be separated from the parcel of grain before that grade can be assigned to the grain." Dockage is removed by the following cleaning procedures described in this chapter.

The sample as it arrives is referred to as the uncleaned or dirty sample. Its weight is the **gross weight** of the sample. Dockage is assessed on the gross weight of the sample.

Dockage is assessed in two stages.

1. Follow *Normal cleaning procedures*, using the Carter dockage tester.
2. Follow procedures for *Cleaning for grade improvement*. This cleaning can be done at any time after normal cleaning has been completed.

Dockage not reported

▲ **Important:** Dockage is not reported for samples graded

- *Flaxseed, Sample CW/CE Account Fireburnt*
- *Solin, Sample CW Account Fireburnt*
- *Flaxseed/Solin, Sample Salvage*
- *Flaxseed/Solin, Sample Condemned*

Normal cleaning procedures

▲ **Important:** Wear gloves and a mask to handle any samples that you suspect may contain hazardous substances.

1. Set up the Carter dockage tester as follows:

Feed control	#4
Air control	#3
Riddle	No. 000
Top sieve	Blank tray
Centre sieve	None
Bottom sieve	None
Sieve cleaner control	Off

2. You need the No. 4.5 round-hole sieve, and one wire sieve, depending on the size of the flaxseed or solin and the nature of the material to be removed.

Round-hole sieves	Wire sieves
No. 4.5	No. 4x14
	No. 3x16

3. Using a Boerner-type divider, divide the uncleaned sample to obtain a representative portion.
   - Official samples should be at least 900 g.
   - Unofficial samples should be at least 750 g.

4. For hand sieving use approximately 250 g
   1. Nest the wire sieve over the No. 4.5 round-hole sieve.
   2. Shake each representative portion until maximum cleanout has been achieved through the wire sieve.
   3. Handpick seed clusters and return the seeds to the cleaned sample.
   4. Remove the wire sieve.
   5. Shake the sample until maximum cleanout has been achieved through the No. 4.5 round-hole sieve.

5. Combine the separated 250-g portions.

6. Turn on the Carter dockage tester.

7. Pour the entire working sample into the hopper.

8. After the sample has passed through the machine, turn off the machine.

9. Lightly snap the retainer rod of the aspiration pan to loosen material gathered on the air screen.

10. Using a Boerner-type divider, divide not less than 20 g from the cleaned working sample.

11. From the 20-g portion, determine the percentage by weight of inseparable foreign material.

12. Determine dockage, using the list under *Composition of dockage*.

Composition of dockage

Dockage includes

- Material remaining on top of the wire sieve, except flaxseed clusters and whole flaxseed that are put back into the sample
- Material that passes through the No. 4.5 round-hole sieve
- Material removed by aspiration
- Material that passes over the No. 000 riddle
- Soft earth pellets handpicked from the cleaned sample
- Inseparable material up to established grade tolerances handpicked from the clean sample
- Material removed by *Cleaning for grade improvement*

Primary samples, commercially clean

Commercially clean primary samples can have up to 0.5% for broken and reasonably sound flaxseed or solin deducted from the gross weight of the dockage. For a definition of commercially clean, see *Export shipments.*

Primary samples, not commercially clean

In not commercially clean primary samples there is no allowance for broken and reasonably sound flaxseed or solin.

Sample grades

In sample grades, inseparable admixture is not added to dockage. Where the inseparable admixture exceeds 2.0% of the sample by weight, the admixture becomes a reason for the sample grade and is recorded in remarks.

Rejected account stones

In samples that grade *Rejected (basic grade) Account Stones*, dockage includes inseparable admixture handpicked from the clean sample up to the tolerance.

Cleaning for grade improvement

If the grade of a delivery can be improved by additional cleaning, perform the cleaning and add the additional material to dockage. Cleaning for grade improvement can be done at any time after normal cleaning.

1. After normal cleaning, examine the material to be removed and select your equipment according to the material you want to remove. See the table *Cleaning for grade improvement—Flaxseed or solin* for the list of equipment.
2. Sieve the material by hand or pass it through the Carter dockage tester, depending on the material.

   ▲ **Important:** When you use a hand sieve, move the sieve from left to right 30 times, using a sifting motion. One time is one complete motion from the centre, to one side, to the other side, and back to the centre. The total distance from left to right is 20 cm, or about eight inches.

3. Weigh the additional dockage and add it to the original dockage.

Cleaning for grade improvement—Flaxseed or solin

Material to be removed	Equipment	Effect on composition of dockage
Inseparable material	No. 5 round-hole hand sieve	The material passing through the sieve is included in the dockage. Not more than 5.0% of sound flaxseed or solin may be removed for each single grade improvement achieved.
Lightweight material	Carter dockage tester, with Feed control at #4 and air control at #4.5	The material removed, including damaged seed, is included in the dockage. Not more than 5.0% of sound flaxseed or solin may be removed from the cleaned sample for each single grade improvement achieved.

Optional analysis

Where a shipper requests special cleaning of a carlot of grain at a terminal or transfer elevator, and the elevator manager agrees, dockage material will be analyzed for the presence of grain. The percentage and grade of any grain contained in the dockage will be reported and elevator stocks will be adjusted on the basis of the analysis. Agreement of the shipper and unload elevator must be conveyed to the CGC in writing prior to the analysis being performed.

Procedures

1. Analyze the official sample.
2. Record the following on inspection records:
   - The percentage by gross weight to the nearest 0.1% and the grade of flaxseed/solin.
   - The percentage by gross weight to the nearest 0.1% and the grade of grain separable from dockage.
   - The percentage of dockage.

   Example
   95.0% Flaxseed, No. 1 CW
   4.0% Barley No. 1 CW
   1.0% dockage

Grading

Important definitions

Net weight of sample

The sample after cleaning and removal of dockage is referred to as the cleaned sample. Its weight is the net weight of the sample. Percentages by weight for grading refer to percentages of the cleaned sample, the net weight.

Hazardous substances in samples

Wear gloves and a mask to handle any samples that you suspect may contain hazardous substances. Hazardous substances are defined in the Regulations as "any pesticide, herbicide or desiccant."

Representative portion for grading

All grading is done on representative portions divided down from the cleaned sample, using a Boerner-type divider.

When the concentration of the grading factor is . . .	**Then use . . .**
Low	Optimum portion
High	Minimum portion or more **(do not use less)**

Values in this table represent a range of recommended portions of samples for grading.

Representative portion of flaxseed or solin for grading, grams

Grading factor	**Minimum**	**Optimum**	**Export**
Broken	25	**100**	100
Damage (visual)	10	**50**	50
Damage (crush)	5 strips	**10 strips**	10 strips
Ergot	100	**500**	500
Excreta	working sample	**working sample**	working sample
Fireburnt	working sample	**working sample**	working sample
Heated	10 strips	**10 strips**	10 strips
Inseparable seeds	20	**50**	50
Odour	working sample	**working sample**	working sample
Other classes	20	**50**	50
Sclerotinia sclerotiorum	100	**500**	500
Soft earth pellets	working sample	**working sample**	working sample
Stones	100	**working sample**	working sample

Grading factors

Broken (BKN)

Broken seeds are pieces of flaxseed or solin that are less than three-quarters the size of a whole seed.

▲ **Important:**

- Flaxseed and solin have separate tolerances for *Broken.*
- Broken seeds of flaxseed and solin are also included in *Total damage*.

Representative portion for analysis

Minimum—25 g	Optimum—100 g	Export—100 g

Contaminated grain

▲ **Important:** Wear gloves and a mask to handle any sample that is suspected of containing contaminated grain.

Contaminated is defined in the *"Canada Grain Act"* as; "Contaminated means, in respect of grain, containing any substance in sufficient quantity that the grain is unfit for consumption by persons or animals or is adulterated within the meaning of the regulations made pursuant to sections B.01.046(1), B.15.001 and B.15.002(1) of the *Food and Drugs Act.*"

Samples deemed to be contaminated by the Grain Research Laboratory in consultation with the Chief Grain Inspector for Canada are graded *Flaxseed, Sample Condemned.*

Damage (DMG)

Damage includes

- Seeds that are heated, broken, frosted, green, sprouted, shriveled or otherwise damaged
- Seeds with fractured seed coats

▲ **Important:** Seeds are not considered damaged if they

- Have any side portions of the boll membrane attached but are otherwise sound
- Appear scabbed or blistered but are otherwise sound

Representative portion for analysis

Minimum—10 g	Optimum—50 g	Export—50 g

Number of crushes for analysis

Minimum—5	Optimum—10	Export—10

Procedures

1. Divide the sample to the appropriate representative portion.
2. Handpick the representative portion for visually damaged seeds.

3. Determine the percentage concentration by weight.
4. Prepare and crush the appropriate number of strips from the clean sample. If any heated seeds are detected or if the sample has a heated odour, a minimum of 10 strips must be analyzed.
5. Determine the percentage of non-visual damage.
6. Add the two percentages of damage together to determine the total damage.

Earth pellets (EP)

- Hard earth pellets are pellets that do not crumble under light pressure. See *Stones*.
- Soft earth pellets are pellets that crumble under light pressure. See *Soft earth pellets*.

Ergot (ERG)

Ergot is a plant disease producing elongated fungus bodies with a purplish-black exterior, a purplish-white to off-white interior, and a relatively smooth surface texture.

Representative portion for analysis

Minimum—100 g
Optimum—500 g
Export—500 g

Excreta (EXCR)

▲ **Important:** Wear gloves and a mask to handle any samples that you suspect may contain excreta.

Representative portion for analysis

Minimum—working sample
Optimum—working sample
Export—working sample

Fertilizer pellets (FERT PLTS)

Fertilizer pellets are typically either small, round and white or irregular shaped and pink or red. Fertilizer pellets are not considered a hazardous substance however there is no visible means of assuring that material resembling fertilizer pellets is not some other contaminant.

Representative portion for analysis

Minimum—working sample
Optimum—working sample
Export—working sample

Procedures

- Handpick any fertilizer pellets and determine the concentration basis the net working sample.
- Fertilizer pellets are assessed as stones when the concentration does not exceed 1.0% of the net sample weight.
- Samples containing fertilizer pellets in excess of 1.0% of the net sample weight are graded *Flaxseed, Held IP Suspect Contaminated Grain.*

Note: Canadian Grain Commission personnel should refer to ISO national work instruction "*Suspect Contaminated Grain, Handling Procedures*" for procedures to be followed when handling samples containing fertilizer pellets.

Fireburnt (FBNT)

Samples that show any evidence of being charred or scorched by fire are considered fireburnt. Evidence includes odour, pieces of charred wood, and so on. Fireburnt seeds pop when crushed.

Representative portion for analysis

Minimum—working sample
Optimum—working sample
Export—working sample

Procedures

Samples considered fireburnt are graded *Flaxseed, Sample CW/CE, Account Fireburnt.*

Heated (HTD)

Heated refers to seeds with discoloured cotyledons ranging in colour from orange to dark brown depending on the severity of heat damage. The seed coats of heated seeds are usually shiny brown or black. Severely heated seeds usually have a heated odour.

Number of crushes for analysis

Minimum—10 Optimum—10 Export—10

Procedures

1. Prepare and crush the appropriate number of strips from the clean sample.
2. Examine the crushed seeds for evidence of heating.
3. Determine the percentage of heated seeds.

Inseparable seeds (INSEP SDS)

Inseparable seeds are domestic seeds such as mustard seed, canola, whole shrunken or broken kernels of other grains and weed seeds such as wild oats and lady's thumb that remain in the sample after cleaning.

Representative portion for analysis

Minimum—20 g Optimum—50 g Export—50 g

Odour (ODOR)

There is no numeric tolerance for odour. Consider

- The basic quality of the sample
- The type and degree of the odour
- The presence of visible residue causing the odour

Representative portion for analysis

Minimum—working sample Optimum—working sample Export—working sample

If odour is the grade determinant and there is . . .	**Then the grade is . . .**
A distinct objectionable odour not associated with the quality of the grain, but not heated or fireburnt	*Flaxseed, Sample CW/CE Account Odour*
A distinct heated odour	*Flaxseed, Sample CW/CE Account Heated*
A distinct fireburnt odour	*Flaxseed, Sample CW/CE Account Fireburnt*

Other classes of flaxseed (OCL)

- In solin, other classes of flaxseed refers to classes of brown and golden flaxseedwith high linolenic acid content
- In flaxseed, other classes of flaxseed refers to classes with yellow or golden seed coats.

▲ **Important:** Golden flaxseed and solin may be visually indistinguishable. However, their end uses are quite different. If you are not sure if the sample is golden flaxseed or solin, send the sample to the Chief Grain Inspector.

Representative portion for analysis

Minimum—20 g Optimum—50 g Export—50 g

Other oilseeds

Other oilseeds applies to solin only.

In solin, other oilseeds is part of the tolerance for *Other oilseeds and inseparable seeds.*

Representative portion for analysis

Minimum—20 g Optimum—50 g Export—50 g

Sclerotinia sclerotiorum (SCL)

Sclerotinia sclerotiorum is a fungus producing hard masses of fungal tissue, called *sclerotia*. The sclerotia vary in size and shape, have a course surface texture, vary in exterior color from dark black to gray to white and have a pure white interior.

Representative portion for analysis

Minimum—100 g Optimum—500 g Export—500 g

Soft earth pellets (SEP)

Soft earth pellets are

- Earth pellets that crumble into fine dust under light pressure, using a finger only—if they do not crumble, they are considered *Stones*
- Any non-toxic material of similar consistency

Representative portion for analysis

Minimum—working sample Optimum—working sample Export—working sample

Procedures

1. Handpick soft earth pellets from a representative portion of the cleaned sample.
2. Soft earth pellets are removed as dockage. See *Composition of dockage.*

Stones (STNS)

Stones are hard shale, coal, hard earth pellets, and any other non toxic materials of similar consistency. Fertilizer pellets are assessed as stones when constituting 1.0% or less of the net sample weight. (See *Fertilizer pellets* for specific procedures to be followed when samples contain fertilizer pellets.)

Representative portion for analysis

Minimum—500 g Optimum—1000 g Export—1000 g

Procedures

1. Handpick stones from a representative portion of the cleaned sample.
2. Determine stone concentration in the net sample.

- In western Canada samples of grain containing stones in excess of "basic grade" tolerances, up to 2.5% are graded *Flaxseed, Rejected "basic grade" Account Stones*. The "*basic grade*" refers to a grade established in the Canada Grain Regulations (grades listed in the first column in grade determinant tables) that would have been assigned to the sample if it contained no stones.
- In eastern Canada samples of grain containing stones in excess of grade tolerances are degraded to lower grades. Samples containing stones in excess of the tolerance of the lowest grade established by regulation up to 2.5% are graded *Flaxseed, Sample Canada Eastern Account Stones.*
- In western and eastern Canada grain containing more than 2.5% stones is graded *Flaxseed, Sample Salvage.*

Examples: Western Canada

Basic grade:......................... *Flaxseed, No. 1 CW*

If the above sample contained	Grade in Western Canada
0.08% stones	*Flaxseed, Rejected No. 1 CW Account Stones*
3.0% stones	*Flaxseed, Sample Salvage*

Examples: Eastern Canada

Basic grade:......................... *Flaxseed, No. 1 CE*

If the above sample contained	Grade in Eastern Canada
0.08% stones	*Flaxseed, Sample CE Account Stones*
3.0% stones	*Flaxseed, Sample Salvage*

Treated seed and other chemical substances

Treated seed

Treated seed is grain that has been coated with an agricultural chemical for agronomic purposes. These seed dressings contain a dye to render the treated seed visually conspicuous. The colour of the dye varies depending upon the type of treatment and the type of grain. The current Canadian colour standards for pesticide seed treatments are: cereals–pink or red, canola–baby blue or green. Seed treated with an inoculant may have a green stain. The coatings or stains may appear greasy or powdery and surface area distribution ranges from tiny flecks to complete coverage.

Other chemical substances

Other chemical substances refers to any chemical residues either adhering to the kernel or remaining in the sample and to samples having a chemical odour of any kind.

▲ **Important:** Wear gloves and a mask to handle any samples that you suspect may contain contaminated grain.

Representative portion for analysis

Minimum—working sample	Optimum—working sample	Export—working sample

If a sample is suspected of being coated with a pesticide, desiccant, inoculant or if the sample contains evidence of any foreign chemical substance other than fertilizer pellets, the sample shall be graded *Flaxseed, Held IP Suspect Contaminated Grain*.

Note: Canadian Grain Commission personnel should refer to ISO national work instruction "*Suspect Contaminated Grain, Handling Procedures*" for specific procedures to be followed when handling samples suspected of containing treated seed or other chemical substances.

Primary grade determinants tables

Flaxseed, Canada Western/Canada Eastern (CW/CE)

Grade name	Standard of quality			Standard of cleanliness Commercially pure seed %
	Minimum test weight kg/hL (g/0.5L)	Variety	Degree of soundness	
No. 1 CW/CE	65 (305)	Any variety of the class Flaxseed, Canada Western / Canada Eastern designated as such by Order of the Commission	Mature and sweet	Not more than 1.0% of other seeds that are not readily separable from flaxseed, to be assessed as dockage
No. 2 CW/CE	62 (290)	Any variety of the class Flaxseed, Canada Western / Canada Eastern designated as such by Order of the Commission	Reasonably well matured and sweet	Not more than 1.5% of other seeds that are not readily separable from flaxseed, to be assessed as dockage
No. 3 CW/CE	No minimum	Any variety of flaxseed	Excluded from higher grades on account of light weight or damaged seeds, may have the natural odour associated with low-quality seed, not distinctly sour, musty, rancid or any odour that would indicate serious deterioration	Not more than 2% of other seeds that are not readily separable from flaxseed, to be assessed as dockage

Grade name	Yellow seeded flaxseed and solin–CW only %	Damage				Foreign material included in dockage					
		Broken %	Heated %		Total %	Ergot %	Excreta %	Sclerotinia %	Stones %	Inseparable seeds %	Total %
			CW	CE							
No. 1 CW/CE	2	12.5	0.05	0.2	12.5	0.05	0.02	0.10	0.05	1.0	1.0
No. 2 CW/CE	3	25	0.2	0.5	25	0.05	0.02	0.20	0.05	1.5	1.5
No. 3 CW/CE	4	35	10	10	No limit	0.05	0.02	0.25	0.05	2	2
Grade, if No. 3 specs not met	50% or less—*Flaxseed, Sample CW Account Admixture* 50% or over—use Solin specs	50% or less—*Flaxseed, Sample CW/CE Account Broken* Over 50%—*Sample Broken Grain*	*Flaxseed, Sample CW/CE Account Heated*			*Flaxseed, Sample CW/CE Account Ergot*	*Flaxseed, Sample CW/CE Account Excreta*	*Flaxseed, Sample CW/CE Account Admixture*	2.5% or less—*Flaxseed, Rejected (grade) Account Stones* or *Flaxseed, Sample CE Account Stones* Over 2.5%—*Flaxseed, Sample Salvage*	*Flaxseed, Sample CW/CE Account Admixture*	*Flaxseed, Sample CW/CE Account Admixture*

Solin, Canada Western (CW)

	Standard of quality			Damage		
Grade name	**Minimum test weight kg/hL (g/0.5L)**	**Variety**	**Degree of soundness**	**Broken %**	**Heated %**	**Total %**
No. 1 CW	65 (311)	Any variety of the class Solin, Canada Western designated as such by Order of the Commission	Mature and sweet, good natural colour	5	0.05	5
No. 2 CW	62 (296)	Any variety of the class Solin, Canada Western designated as such by Order of the Commission	Reasonably well matured and sweet, reasonably good natural colour	10	0.2	10
No. 3 CW	No minimum	Any variety of Solin	Excluded from higher grades on account of light weight or damaged seeds, may have the natural odour associated with low-quality seed but not distinctly sour, musty, rancid or having any odour that would indicate serious deterioration	20	1	20
Grade, if No. 3 specs not met				50% or less—*Solin, Sample CW Account Broken* Over 50%—*Sample, Broken Grain*	*Solin, Sample CW Account Heated*	*Solin, Sample CW Account Damage*

		Foreign material included in dockage					
Grade name	**Other classes %**	**Ergot %**	**Excreta %**	**Other oilseeds and inseparable seeds %**	**Sclerotinia %**	**Stones %**	**Total %**
No. 1 CW	1.0	0.05	0.02	1.0	0.10	0.05	1.0
No. 2 CW	1.5	0.05	0.02	1.5	0.20	0.05	1.5
No. 3 CW	2	0.05	0.02	2	**0.25**	0.05	2
Grade, if No. 3 specs not met	50% or less— *Solin, Sample CW Account Admixture* Over 50% —use flaxseed specs	*Solin, Sample CW Account Ergot*	*Solin, Sample CW Account Excreta*	*Solin, Sample CW Account Admixture*	*Solin, Sample CW Account Admixture*	2.5% or less—*Solin, Rejected (grade) Account Stones* Over 2.5%—*Solin, Sample Salvage*	*Solin, Sample CW Account Admixture*

Export shipments

Export shipments can be commercially clean or not commercially clean.

Commercially clean

Shipments are defined as commercially clean when the net dockage does not exceed 2.5% of the sample weight.

Dockage is reported to the nearest
- 0.1% for samples representing commercially clean shipments loaded from a single terminal or transfer elevator
- 0.01% for composite samples representing shipments loaded from more than one terminal or transfer elevator

A deduction for broken and reasonably sound flaxseed handpicked from the material and removed as dockage is allowed
- On shipments not for direct export, of up to 0.50%
- On shipments for direct export, of up to 0.75%

Not commercially clean (NCC)

Shipments that do not meet the standards for commercial cleanliness are referred to as *not commercially clean.* Such shipments are allowed only with the permission of the CGC.

For samples representing not commercially clean shipments approved by the CGC for shipment from terminal and transfer elevators, dockage is reported to the nearest
- 0.1% for samples representing commercially clean shipments loaded from a single terminal or transfer elevator
- 0.01% for composite samples representing shipments loaded from more than one terminal or transfer elevator

Instead of the allowances for broken seed in commercially clean shipments, a direct deduction of up to 0.2% is applied to establish net dockage.

Determination of dockage

Follow procedures for normal cleaning, with the Carter dockage tester set up as follows.

	"CC"	"NCC"
Feed control	#3	#4
Air control	#2	#3
Riddle	None	None
Top sieve	Blank tray	Blank tray
Centre sieve	None	None
Bottom sieve	None	None
Sieve cleaner	Off	Off

You will also need the following hand sieves.

Round-hole sieves	Wire sieves
No. 4.5	No. 4x14 No. 3x16

Composition of dockage

In export grade flaxseed and solin, dockage consists of

- Material that remains on top of the wire sieve
- Material that passes through the No. 4.5 round-hole hand sieve, less the applicable allowance of broken and reasonably sound flaxseed
- Material removed by aspiration
- Inseparable material up to established grade tolerances, handpicked from the cleaned sample

Grading

Flaxseed and solin on export are graded in accordance with export specifications. Where there are no export specifications the primary specifications are used.

Export grade determinants tables

Flaxseed, Canada Western/Canada Eastern (CW/CE)

Grade name	Total removable material %	Foreign material included in dockage				Yellow seeded flaxseed and solin—CW only %	Damage		
		Ergot %	Sclerotinia %	Stones %	Total including inseparable seeds %		Broken %	Heated %	Total %
No. 1 CW/CE	2.5	0.05	0.10	0.05	1.0	2	12.5	0.05	12.5
No. 2 CW/CE	2.5	0.05	0.20	0.05	1.5	3	25	0.2	25
No. 3 CW/CE	2.5	0.05	0.25	0.05	2	4	35	10	No limit within broken and heated tolerances

Solin, Canada Western (CW)

Grade name	Total removable material %	Foreign material included in dockage					Other classes of flaxseed %	Damage		
		Ergot %	Other inseparable seeds %	Sclerotinia %	Stones %	Total %		Broken %	Heated %	Total %
No. 1 CW	2.5	0.05	1.0	0.10	0.05	1.0	1.0	5	0.05	5
No. 2 CW	2.5	0.05	1.5	0.20	0.05	1.5	1.5	10	0.2	10
No. 3 CW	2.5	0.05	2	0.25	0.05	2	2	20	10	20

12. Domestic mustard seed

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Classes

Domestic mustard seed is classed as yellow, brown or oriental, or mixed. The class forms part of the grade name; for example, *Domestic Mustard Seed, Sample Canada Yellow Account Heated.*

Identifying classes of domestic mustard seed

Class	Colour	Approximate size	Shape	Surface
Yellow	Light creamy-yellow to yellow Occasional seed is light or yellowish brown	2 to 3 mm in diameter	Spherical or oval	Textured, similar to an orange peel, hilum area–small white spot on a deep yellow to light tan circular area
Brown	Reddish-brown to dark-brown	2 mm or less in diameter	Spherical or oval	Predominant netting, ridges are thicker than oriental mustard, hilum area – white on a black or darker brown circular area
Oriental	Predominantly yellow to dark-yellow, with some seeds ranging from light brown to brown	1.2 to 2.0 mm in width, 1.6 to 3.0 in length	Oval	Predominant netting, not as predominant as brown mustard, ridges are fine, hilum area – white on a darker yellow to lighter brown circular area
Mixed	Yellow and brown mustard seed containing less than 90.0% of one class See also *Domestic mustard seed, oriental: Other classes*			

Determination of dockage

Definitions

Dockage is assessed and recorded to the nearest 0.1%.

Dockage is defined under the Canada Grain Act as "any material intermixed with a parcel of grain, other than kernels of grain of a standard of quality fixed by or under this Act for a grade of that grain, that must and can be separated from the parcel of grain before that grade can be assigned to the grain." Dockage is removed by following the cleaning procedures described in this chapter.

The sample as it arrives is referred to as the uncleaned or dirty sample. Its weight is the **gross weight** of the sample. Dockage is assessed on the gross weight of the sample.

Dockage is assessed in two stages.

1. Follow *Normal cleaning procedures*, using the Carter dockage tester.
2. Follow procedures for *Cleaning for grade improvement*. This cleaning can be done at any time after normal cleaning has been completed.

Dockage not reported

▲ **Important:** Dockage is not reported for samples grading

- *Domestic Mustard Seed, Sample Canada (class) Account Fireburnt*
- *Domestic Mustard Seed, Sample Salvage*
- *Domestic Mustard Seed, Sample Condemned*

Normal cleaning procedures

▲ **Important:** Wear gloves and a mask to handle any samples that you suspect may contain hazardous substances.

1. Set up the Carter dockage tester as follows:

Feed control	#3
Air control	#7
Riddle	No. 000
Top sieve	Blank tray
Centre sieve	none
Bottom sieve	none
Sieve cleaner control	off

2. You also need the following hand sieves:

Round-hole hand sieves	Slotted hand sieves
No. 5.5	No. .028
No. 6	No. .032
No. 6.5	No. .035
No. 7	No. .038
No. 7.5	No. .040

3. Using a Boerner-type divider, divide the uncleaned sample to obtain a representative portion.
   - Official samples should be at least 900 g.
   - Unofficial samples should be at least 750 g.

4. For hand sieving use approximately 250 g.

▲ **Important:**

- Ensure you start with the right sized sieves.
- When you use a hand sieve, move the sieve from left to right 30 times, using a sifting motion. One time is one complete motion from the centre to one side, to the other side, to the other side, and back to the centre. The total distance from left to right is 20 cm, or about eight inches.

   1. Use whichever round-hole sieve will achieve maximum removal of large material with minimum loss of domestic mustard seed. Nest the round-hole sieve over the slotted sieve.
   2. Use whichever slotted sieve will achieve maximum removal of weed seeds with minimum loss of domestic mustard seed.

5. Combine the separated, cleaned 250-g portions.
6. Turn on the Carter dockage tester.
7. Pour the sample into the hopper.
8. After the sample has passed through the machine, turn off the machine.
   - Reduce the air setting to #5 if there is a large loss of whole, reasonably sound seed.
   - If the sample after normal cleaning with air control at #7 qualifies only for *Sample* grade, you must start all over again. Recombine the sample and whatever material has been removed, and re-assess dockage with the air control at #5.

9. Determine dockage, using the list under *Composition of dockage*.

Composition of dockage

Dockage includes

- Material remaining on top of the round-hole hand sieve
- Material passing through the slotted hand sieve
- Material passing over the No. 000 riddle
- Material removed by aspiration
- Material removed by *Cleaning for grade improvement*

Cleaning for grade improvement

If the grade of a delivery can be improved by additional cleaning, perform the cleaning and add the additional material to dockage. Cleaning for grade improvement can be done at any time after normal cleaning.

Carter dockage tester

1. After normal cleaning, examine the material to be removed and select your equipment according to the material you want to remove. See the table *Cleaning for grade improvement— domestic mustard seed.*
2. Pass the sample through the Carter dockage tester.
3. Weigh the additional dockage and add it to the original dockage.

Spiral cleaner— **for yellow mustard seed and only upon request**

Operating procedures

1. The sample to be cleaned by the spiral is the net sample remaining after normal cleaning procedures.
2. Pour the sample into the feed hopper at the top of the spiral. Once the sample has passed through the spiral, lightly tap it to remove any lodged seeds remaining on the flights..
3. Collect the seeds that have discharged from the bottom spout (spout closest to the core of the cleaner)
4. Determine the percentage by weight of the seeds that have discharged and determine if more than 5.0% of yellow mustard has been removed per grade improvement.

Reporting procedures

1. Where the grade is not improved or more than 5.0% of mustard is removed for each grade improvement, the grade and dockage will not be revised.
2. Where the grade can be improved while removing less than 5.0% of domestic mustard for each grade improvement, the certificate will state only the grade and dockage achieved through use of the spiral cleaner.

Cleaning for grade improvement—domestic mustard seed

Material to be removed	Equipment		Effect on composition of dockage
Excessive inseparable weed seeds or damaged mustard seeds for all classes of mustard seed	Spiral cleaner—on request, for yellow mustard seed only		Not more than about 5.0% of domestic mustard seed may be removed for each grade improvement achieved.
	Carter dockage tester set as follows:		
	Feed control	#3	
	Air control	#7	
	Riddle	No. 000	
	Top sieve	No. 4.5 or No. 5 round-hole	
	Centre sieve	blank tray	
	Bottom sieve	none	
	Sieve cleaner control	off	
Canola or wild mustard in yellow mustard seed	Carter dockage tester set as follows:		The material passing through the sieve is included in the dockage. Not more than 5.0% of sound domestic mustard seed may be removed for each grade improvement achieved.
	Feed control	#3	
	Air control	off	
	Riddle	No. 000	
	Top sieve	none	
	Centre sieve	No. 4.5 or No. 5 round-hole	
	Bottom sieve	blank tray	
	Sieve cleaner control	off	

Optional analysis

Where a shipper requests special cleaning of a carlot of grain at a terminal or transfer elevator, and the elevator manager agrees, dockage material will be analyzed for the presence of grain. The percentage and grade of any grain contained in the dockage will be reported and elevator stocks will be adjusted on the basis of the analysis. Agreement of the shipper and unload elevator must be conveyed to the CGC in writing prior to the analysis being performed.

Procedures

1. Analyze the official sample.
2. Record the following on inspection records:
   - The percentage by gross weight to the nearest 0.1% and the grade of mustard.
   - The percentage by gross weight to the nearest 0.1% and the grade of grain separable from dockage.
   - The percentage of dockage.

   Example
   95.0% Domestic Mustard Seed, No. 1 CAN Yellow
   4.0% Rye, No. 2 CW
   1.0% dockage

Grading

Important definitions

Net weight of sample

The sample after cleaning and removal of dockage is referred to as the cleaned sample. Its weight is the net weight of the sample. For grading, percentages by weight refer to percentages of the net weight.

Kernel counts (K)

A kernel count is the number of kernel-sized pieces in a 500 g sample.

Hazardous substances in samples

Wear gloves and a mask to handle any samples that you suspect may contain hazardous substances. Hazardous substances are defined in the Regulations as "any pesticide, herbicide or desiccant."

Crush

A crush is one pass of the roller under firm pressure over a 100-seed stick on masking tape.

Representative portion for grading

All grading is done on representative portions divided down from the cleaned sample, using a Boerner-type divider.

When the concentration of the grading factor is . . .	Then use . . .
Low	Optimum portion size
High	Minimum portion size or more **(do not use less)**

Values in the table on the next page represent a range of recommended portions of samples for grading.

Grading—Domestic Mustard Seed, Brown

Representative portion of domestic mustard seed, brown for grading, grams

Grading factor	Minimum	Optimum	Export
Canola	5	25	5-25
Cockle	5	50	5-50
Colour	working sample	working sample	working sample
Conspicuous admixtures	5	50	5-50
Damage	5	10	10
Distinctly detrimental	5	50	5-50
Distinctly green	5 crushes	10 crushes	10 crushes
Ergot	100	500	500
Excreta	working sample	working sample	working sample
Fertilizer pellets	1000	1000	1000
Fireburnt	working sample	working sample	working sample
Heated	5 crushes	10 crushes	10 crushes
Inconspicuous admixture	5	25	5-25
Odour	working sample	working sample	working sample
Other classes	2	5	2-5
Rime	5	10	10
Sclerotinia sclerotiorum	100	500	500
Soft earth pellets	100	working sample	working sample
Stones	100	working sample	working sample
Wild mustard seed	5	25	5-25

Grading factors

Canola (CNL)

In brown mustard, canola is classed as *Inconspicuous admixture*.

▲ **Important:** Grain inspectors are authorized to withhold grades on samples with unidentifiable admixtures until results of analyses are confirmed by seed analysts.

Representative portion for analysis

Minimum—5 g
Optimum—25 g
Export—5-25 g

Classes

Domestic mustard seed is classed as yellow, brown or oriental, or mixed. The class forms part of the grade name; for example, *Domestic Mustard Seed, Sample Canada Brown, Account Heated*. For a description of classes, see *Identifying classes of domestic mustard seed.*

Cockle (COC)

Cockle, or cow cockle, is a hard roundish seed with a dull surface covered with numerous small bumps giving the seed a rough spiky appearance. Colour can be deep black, bluish-black or orangish-brown. In brown mustard, cockle is part of *Conspicuous admixture*.

Representative portion for analysis

Minimum—5 g
Optimum—50 g
Export—5-50 g

Procedures

Use a microscope to examine the sample.

Colour (CLR)

In analysing colour, consider

- The general degree of maturity
- The amount and degree of discolouration, such as from weathering
- The proportion of damaged seeds, which are distinctly green or otherwise colour-damaged. See *Damage* and *Distinctly green*.
- The amount of rime—light rime is considered in the overall appearance of the sample. See *Damage*.

Representative portion for analysis

Minimum—working sample
Optimum—working sample
Export—working sample

Conspicuous admixture (CADMX)

Conspicuous admixture is also called *Conspicuous inseparable seeds* in the grade determinants tables. In brown mustard, conspicuous admixture includes

- Small seeds or broken seeds of other grains
- Weed seeds such as cow cockle, lamb's-quarters, ball mustard, pigweed, cleavers, smartweed and lady's-thumb.
- Any conspicuous foreign material except stones and soft earth pellets

Representative portion for analysis

Minimum—5 g	Optimum—50 g	Export—5-50 g

▲ **Important:** Grain inspectors are authorized to withhold grades on samples with unidentifiable admixtures until results of analyses are confirmed by seed analysts.

Contaminated grain

▲ **Important:** Wear gloves and a mask to handle any sample that is suspected of containing contaminated grain.

Contaminated is defined in the *"Canada Grain Act"* as; "Contaminated means, in respect of grain, containing any substance in sufficient quantity that the grain is unfit for consumption by persons or animals or is adulterated within the meaning of the regulations made pursuant to sections B.01.046(1), B.15.001 and B.15.002(1) of the *Food and Drugs Act*."

Samples deemed to be contaminated by the Grain Research Laboratory in consultation with the Chief Grain Inspector for Canada are graded *Domestic Mustard Seed, Sample Canada Brown Condemned.*

Damage (DMG)

Damaged seeds include those that are

- Distinctly shrunken or shrivelled
- Badly discoloured from mould
- Completely and densely covered with rime
- Excessively weathered, sprouted, distinctly green, heated or otherwise damaged

Representative portion for analysis

Minimum—5 g
Optimum—10 g
Export—10 g

Number of crushes (100-seed strips) for analysis

Minimum—5
Optimum—10
Export—10

Procedures

1. Handpick the representative portion to determine the content of visually damaged seeds.
2. Determine the percentage by weight.
3. Crush the appropriate number of strips from the portion remaining.
   A crush is made with only one pass of the roller under firm pressure.
4. Convert the count of damaged seeds on the strip to percentage by weight. Add the percentage of visually damaged seeds and crushed seeds for *Total damage*.

Distinctly detrimental (DDET)

Admixtures considered distinctly detrimental include

- Cow cockle
- Sclerotinia

Representative portion for analysis

Minimum—5 g
Optimum—50 g
Export—5-50 g

Distinctly green (DGR)

Distinctly green tolerances are applied to crushed seeds which are a distinct green throughout. Pale green or immature seeds are taken into account in the evaluation of colour. See *Colour*.

Number of crushes (100-seed strips) for analysis

Minimum—5
Optimum—10
Export—10

Procedures

See Damage.

Earth pellets (EP)

- Hard earth pellets are pellets that do not crumble under light pressure.
  See *Stones*.
- Soft earth pellets are pellets that crumble under light pressure.
  See *Soft earth pellets*.

Ergot (ERG)

Ergot is a plant disease producing elongated fungus bodies with a purplish-black exterior, a purplish-white to off white interior, and a relatively smooth surface texture.

Representative portion for analysis

Minimum—100 g	Optimum—500 g	Export—500 g

Excreta (EXCR)

▲ **Important:** Wear gloves and a mask to handle any samples that you suspect may contain excreta.

Representative portion for analysis

Minimum—working sample	Optimum—working sample	Export—working sample

Procedures

- If the amount of excreta is not excessive, determine the kernel count.
- If the kernel count is excessive, determine the weight of excreta as a percentage of the net weight of the sample.

Fertilizer pellets (FERT PLTS)

Fertilizer pellets are typically either small, round and white or irregular shaped and pink or red. Fertilizer pellets are not considered a hazardous substance however there is no visible means of assuring that material resembling fertilizer pellets is not some other contaminant.

Representative portion for analysis

Minimum—1000 g	Optimum—1000 g	Export—1000 g

Procedures

- Handpick any fertilizer pellets and determine the concentration basis the net working sample.
- Fertilizer pellets are considered as a separate grading factor in all grades of domestic mustard seed.
  - Grades of domestic mustard seed may contain one fertilizer pellet in 1000 g, including samples of commercially clean mustard seed.
  - Samples containing one fertilizer pellet per 500 g up to 1.0% are graded *Domestic Mustard Seed, Sample Canada Brown Account Fertilizer Pellets.*
  - Samples containing fertilizer pellets in excess of 1.0% of the net sample weight are graded *Domestic Mustard Seed, Held IP Suspect Contaminated Grain.*

Important: For samples between 500 and 1000 g – if the sample contains one fertilizer pellet, the sample grades *Domestic Mustard Seed, Sample Canada Brown Account Fertilizer Pellets.* If the sample contains no fertilizer pellets, it is considered to be within the grade tolerance.

Note: Canadian Grain Commission personnel should refer to ISO national work instruction "*Suspect Contaminated Grain, Handling Procedures*" for specific procedures to be followed when handling samples containing fertilizer pellets.

Fireburnt kernels (FBNT)

Samples that show any evidence of being charred or scorched by fire are considered fireburnt. Evidence includes odour, pieces of charred wood, and so on. Fireburnt seeds pop when crushed.

Representative portion for analysis

Minimum—working sample	Optimum—working sample	Export—working sample

Procedures

Samples considered fireburnt are graded *Domestic Mustard Seed, Sample Canada Brown Account Fireburnt.*

Frost

See *Damage.*

Green

See *Distinctly green.*

Heated kernels (HTD)

Heated refers only to seeds that are distinctly heated or badly binburnt. Heated seeds have a heated odour.

Crushed seeds may be

- Black—badly binburnt
- Dark chocolate brown—distinctly heated
- Light tan—slightly damaged from oxidation. If they have an odour or are present with brown or black crushed seeds, they are considered heated. Otherwise, they are included in *Total damage*, not heated.

Number of crushes (100-seed strips) for analysis

Minimum—5	Optimum—10	Export—10

Procedures

1. Examine 5 crushes for evidence of heating.
2. If no heated seeds detected, assess crushes for other damage. See *Damage.*
3. If at least 1 heated seed is detected, crush and assess an additional 5 crushes for heated seeds.

Inconspicuous admixture (INC ADMX)

In brown mustard seed, inconspicuous admixture includes

- Canola
- Common wild mustard seed
- Any other seeds that blend with brown mustard seed and are not readily identified

Representative portion for analysis

Minimum—5 g	Optimum—25 g	Export—5-25 g

▲ **Important:** Grain inspectors are authorized to withhold grades on samples with unidentifiable admixtures until results of analyses are confirmed by seed analysts.

Mixed classes (MXD CL)

Samples are designated mixed classes when they contain sufficient quantities of other classes of mustard seed. See *Other classes*.

Odour (ODOR)

There is no numeric tolerance for odour. Consider

- The basic quality of the sample
- The type and degree of the odour
- The presence of visible residue causing the odour

Representative portion for analysis

Minimum—working sample	Optimum—working sample	Export—working sample

If odour is the grade determinant and there is . . .	Then the grade is . . .
A distinct objectionable odour not associated with the quality of the grain, but not heated or fireburnt	*Domestic Mustard Seed, Sample Canada Brown, Account Odour*
A distinct heated odour	*Domestic Mustard Seed, Sample Canada Brown, Account Heated*
A distinct fireburnt odour	*Domestic Mustard Seed, Sample Canada Brown, Account Fireburnt*

Other classes (OCL)

In brown mustard seed, other classes are yellow and oriental mustard seed.

If a sample contains more than 10.0% other classes, it is designated *Mixed*. Mixed mustard seed is graded according to all specifications except other classes, as in *Mustard Seed, No. 1 Canada Mixed*.

Representative portion for analysis

Minimum—2 g	Optimum—5 g	Export—2-5 g

Rime

Rime is the lining of the pod adhered to the seed. Seeds that are completely and densely covered with white rime are classed as damaged in any grade. Seeds with light rime sparsely covering the seed coat are

- Classed as sound if not otherwise damaged
- Considered in the evaluation of colour. See *Colour*.

Representative portion for analysis

Minimum—5 g
Optimum—10 g
Export—10 g

Sclerotinia sclerotiorum (SCL)

Sclerotinia sclerotiorum is a fungus producing hard masses of fungal tissue, called *sclerotia*. The sclerotia vary in size and shape, have a course surface texture, vary in exterior color from dark black to gray to white and have a pure white interior.

Representative portion for analysis

Minimum—100 g
Optimum—500 g
Export—500 g

Soft earth pellets (SEP)

Soft earth pellets are

- Earth pellets that crumble into fine dust under light pressure, using a finger only— if they do not crumble, they are considered *Stones*.
- Any non-toxic material of similar consistency

▲ **Important:** In domestic mustard seed, fertilizer pellets are not considered soft earth pellets. See *Fertilizer pellets*.

Representative portion for analysis

Minimum—100 g
Optimum—working sample
Export—working sample

Stones (STNS)

Stones are hard shale, coal, hard earth pellets, and any other non toxic materials of similar consistency.

Note: Fertilizer pellets are **not** assessed as stones in samples of Domestic Mustard Seed. See *Fertilizer pellets.*

Representative portion for analysis

Minimum—100 g
Optimum—working sample
Export—working sample

Procedures

1. Handpick stones from a representative portion of the cleaned sample.
2. Determine stone concentration in the net sample.

- In western Canada samples of grain containing stones in excess of "basic grade" tolerances, up to 2.5% are graded *Domestic Mustard Seed, Rejected "basic grade" Account Stones*. The "*basic grade*" refers to a grade established in the Canada Grain Regulations (grades listed in the first column in grade determinant tables) that would have been assigned to the sample if it contained no stones.
- In eastern Canada samples of grain containing stones in excess of grade tolerances are degraded to lower grades. Samples containing stones in excess of the tolerance of the lowest grade established by regulation up to 2.5% are graded *Domestic Mustard Seed, Sample Canada Brown Account Stones.*
- In western and eastern Canada grain containing more than 2.5% stones is graded *Domestic Mustard Seed, Sample Salvage.*

Examples: Western Canada

Excerpt from grade determinant tables for
Domestic Mustard Seed, Brown, Canada

Grade name	Stones %
No. 1 Canada	0.05
No. 2 Canada	0.05
No. 3 Canada	0.05
No. 4 Canada	0.10

Basic grade:......................... *Domestic Mustard Seed,*
No. 2 Canada Brown
Reason for basic grade:....... 2.0% Distinctly green

If the above sample contained	Grade in western Canada
0.08% stones	*Domestic Mustard Seed,* *Rejected No. 2 Canada Brown Account Stones*
1.0% stones	*Domestic Mustard Seed,* *Rejected No. 2 Canada Brown Account Stones*
3.0% stones	*Domestic Mustard Seed, Sample Salvage*

Examples: Eastern Canada

Excerpt from grade determinant tables for
Domestic Mustard Seed, Brown, Canada

Grade name	Stones %
No. 1 Canada	0.05
No. 2 Canada	0.05
No. 3 Canada	0.05
No. 4 Canada	0.10

Basic grade:......................... *Domestic Mustard Seed,*
No. 2 Canada Brown
Reason for basic grade:....... 2.0% Distinctly green

If the above sample contained	Grade in eastern Canada
0.08% stones	*Domestic Mustard Seed, No. 4 Canada Brown*
1.0% stones	*Domestic Mustard Seed,* *Sample Canada Brown Account Stones*
3.0% stones	*Domestic Mustard Seed, Sample Salvage*

Treated seed and other chemical substances

Treated seed

Treated seed is grain that has been coated with an agricultural chemical for agronomic purposes. These seed dressings contain a dye to render the treated seed visually conspicuous. The colour of the dye varies depending upon the type of treatment and the type of grain. The current Canadian colour standards for pesticide seed treatments are: cereals–pink or red, canola–baby blue or green. Seed treated with an inoculant may have a green stain. The coatings or stains may appear greasy or powdery and surface area distribution ranges from tiny flecks to complete coverage.

Other chemical substances

Other chemical substances refers to any chemical residues either adhering to the kernel or remaining in the sample and to samples having a chemical odour of any kind.

▲ **Important:** Wear gloves and a mask to handle any samples that you suspect may contain contaminated grain.

Representative portion for analysis

Minimum—working sample	Optimum—working sample	Export—working sample

If a sample is suspected of being coated with a pesticide, desiccant, inoculant or if the sample contains evidence of any foreign chemical substance other than fertilizer pellets, the sample shall be graded *Domestic Mustard Seed, Held IP Suspect Contaminated Grain*.

Note: Canadian Grain Commission personnel should refer to ISO national work instruction "*Suspect Contaminated Grain, Handling Procedures*" for specific procedures to be followed when handling samples suspected of containing treated seed or other chemical substances.

Variety (VAR)

Domestic mustard seed is graded without reference to variety.

Wild mustard (WM)

Wild mustard seeds are classed as *Inconspicuous admixture*.

Representative portion for analysis

Minimum—5 g	Optimum—25 g	Export—5-25 g

▲ **Important:** Grain inspectors are authorized to withhold grades on samples with unidentifiable admixtures until results of analyses are confirmed by seed analysts.

Primary and export grade determinants tables

Domestic Mustard Seed, Brown, Canada (CAN)

Grade name	Standard of quality		Damage		
	Degree of soundness	Other classes %	Distinctly green %	Heated %	Total %
No. 1 Canada	Reasonably well matured, sweet, good natural colour	0.5	1.5	0.10	1.5
No. 2 Canada	Fairly well matured, sweet, reasonably good colour	2	2.0	0.20	3
No. 3 Canada	May have the natural odour associated with low-quality seed not any odour that would indicate serious deterioration	5	3.5	0.5	5
No. 4 Canada	May have the natural odour associated with low-quality seed not any odour that would indicate serious deterioration	10	3.5	1	10
Grade, if No. 4 specs not met		Over 10%—use all other grading criteria and grade as *Domestic Mustard Seed (grade) Mixed*	*Domestic Mustard Seed, Sample Canada Brown Account Damaged*	*Domestic Mustard Seed, Sample Canada Brown Account Heated*	*Domestic Mustard Seed, Sample Canada Brown Account Damaged*

Grade name	Inconspicuous admixture %	Conspicuous inseparable seeds				Ergot %	Excreta %	Soft earth pellets %	Stones %
		Distinctly detrimental							
		Cow cockle %	Sclerotinia %	Total distinctly detrimental %	Total %				
No. 1 Canada	1.0	0.10	0.10	0.10	0.3	0.05	1 K	0.01	0.05
No. 2 Canada	1.0	0.20	0.20	0.20	0.5	0.05	1 K	0.20	0.05
No. 3 Canada	1.0	0.3	0.3	0.3	0.7	0.05	1 K	0.3	0.05
No. 4 Canada	1	1	1	1	3	0.05	0.005	1	0.1
Grade, if No. 4 specs not met	*Domestic Mustard Seed, Sample Canada Brown Account Admixture*					*Domestic Mustard Seed, Sample Canada Brown Account Ergot*	*Domestic Mustard Seed, Sample Canada Brown Account Excreta*	*Domestic Mustard Seed, Sample Canada Brown Account Admixture*	2.5% or less—*Domestic Mustard Seed, Rejected (grade) Brown Account Stones*, or *Domestic Mustard Seed, Sample Canada Brown Account Stones* Over 2.5%—*Domestic Mustard Seed, Sample Salvage*

K Number of kernel-sized pieces in 500 g

Note: The class, whether yellow, oriental, brown or mixed, is added to the grade name.

Grading—Domestic Mustard Seed, Oriental

Representative portion of domestic mustard seed, oriental for grading, grams

Grading factor	Minimum	Optimum	Export
Blotched seeds	25	50	50
Canola	5	25	5-25
Cockle	5	50	5-50
Colour	working sample	working sample	working sample
Conspicuous admixture	5	50	5-50
Damage	5	10	10
Distinctly detrimental	5	50	5-50
Distinctly green	5 crushes	10 crushes	10 crushes
Ergot	100	500	500
Excreta	working sample	working sample	working sample
Fertilizer pellets	1000	1000	1000
Fireburnt	working sample	working sample	working sample
Heated	5 crushes	10 crushes	10 crushes
Inconspicuous admixture	5	25	5-25
Odour	working sample	working sample	working sample
Other classes	2	5	2-5
Rime	5	10	10
Sclerotinia sclerotiorum	100	500	500
Soft earth pellets	100	working sample	working sample
Stones	100	working sample	working sample
Wild mustard seed	5	25	5-25

Grading factors

Blotched seeds

Blotched seeds are oriental mustard seeds with black or brown discolourations on the seed coat.

- Seeds only partly discoloured but otherwise sound are considered sound, but the discolouration is taken into account in the evaluation of colour. See *Colour*.
- Seeds completely discoloured by blotch are considered damaged. See *Damage*.

Representative portion for analysis

Minimum—25 g	Optimum—50 g	Export—50 g

Canola (CNL)

In oriental mustard, canola is classed as *Inconspicuous admixture*.

▲ **Important:** Grain inspectors are authorized to withhold grades on samples with unidentifiable admixtures until results of analyses are confirmed by seed analysts.

Representative portion for analysis

Minimum—5 g	Optimum—25 g	Export—5-25 g

Classes

Domestic mustard seed is classed as yellow, brown or oriental, or mixed. The class forms part of the grade name; for example, *Domestic Mustard Seed, Sample Canada Oriental, Account Heated*. For a description of classes, see *Identifying classes of domestic mustard seed.*

Cockle (COC)

Cockle, or cow cockle, is a hard roundish seed with a dull surface covered with numerous small bumps giving the seed a rough spiky appearance. Colour can be deep black, bluish-black or orangish-brown. In oriental mustard, cockle is part of *Conspicuous admixture*.

Representative portion for analysis

Minimum—5 g	Optimum—50 g	Export—5-50 g

Procedures

Use a microscope to examine the sample.

Colour (CLR)

In analysing colour, consider

- The general degree of maturity
- The amount and degree of discolouration, such as from weathering
- The proportion of damaged seeds, which are distinctly green or otherwise colour-damaged. See *Damage* and *Distinctly green.*
- The amount of rime—light rime is considered in the overall appearance of the sample. See *Damage.*

Representative portion for analysis

Minimum—working sample
Optimum—working sample
Export—working sample

Conspicuous admixture (CADMX)

Conspicuous admixture is called *Conspicuous inseparable seeds* in the grade determinants tables. In oriental mustard, conspicuous admixture includes

- Small seeds or broken seeds of other grains
- Weed seeds such as cow cockle, lamb's-quarters, ball mustard, pigweed, cleavers, smartweed and lady's-thumb.
- Any conspicuous foreign material except stones and soft earth pellets

Representative portion for analysis

Minimum—5 g
Optimum—50 g
Export—5-50 g

▲ **Important:** Grain inspectors are authorized to withhold grades on samples with unidentifiable admixtures until results of analyses are confirmed by seed analysts.

Contaminated grain

▲ **Important:** Wear gloves and a mask to handle any sample that is suspected of containing contaminated grain.

Contaminated is defined in the *"Canada Grain Act"* as; "Contaminated means, in respect of grain, containing any substance in sufficient quantity that the grain is unfit for consumption by persons or animals or is adulterated within the meaning of the regulations made pursuant to sections B.01.046(1), B.15.001 and B.15.002(1) of the *Food and Drugs Act.*"

Samples deemed to be contaminated by the Grain Research Laboratory in consultation with the Chief Grain Inspector for Canada are graded *Domestic Mustard Seed, Sample Canada Oriental Condemned.*

Damage (DMG)

Damaged seeds include those that are

- Distinctly shrunken or shrivelled
- Badly discoloured by mould
- Completely discoloured by blotch
- Completely and densely covered with rime
- Excessively weathered, sprouted, distinctly green, heated or otherwise damaged

Representative portion for analysis

Minimum—5 g
Optimum—10 g
Export—10 g

Number of crushes (100-seed strips) for analysis

Minimum—5
Optimum—10
Export—10

Procedures

1. Handpick the representative portion to determine the content of visually damaged seeds.
2. Determine the percentage by weight.
3. Crush the appropriate number of strips from the portion remaining.
   A crush is made with only one pass of the roller under firm pressure.
4. Convert the count of damaged seeds on the strip to percentage by weight. Add the percentage of visually damaged seeds and crushed seeds for *Total damage*.

Distinctly detrimental (DDET)

Admixtures considered distinctly detrimental include

- Cow cockle
- Sclerotinia

Representative portion for analysis

Minimum—5 g
Optimum—50 g
Export—5-50 g

Distinctly green (DGR)

Distinctly green tolerances are applied to crushed seeds which are a distinct green throughout. Pale green or immature seeds are taken into account in the evaluation ofcolour. See *Colour*.

Number of crushes (100-seed strips) for analysis

Minimum—5
Optimum—10
Export—10

Procedures

See *Damage*.

Earth pellets (EP)

- Hard earth pellets are pellets that do not crumble under light pressure.
  See *Stones*.
- Soft earth pellets are pellets that crumble under light pressure.
  See *Soft earth pellets*.

Ergot (ERG)

Ergot is a plant disease producing elongated fungus bodies with a purplish-black exterior, a purplish-white to off white interior, and a relatively smooth surface texture.

Representative portion for analysis

Minimum—100 g
Optimum—500 g
Export—500 g

Excreta (EXCR)

▲ **Important:** Wear gloves and a mask to handle any samples that you suspect may contain excreta.

Representative portion for analysis

Minimum—working sample
Optimum—working sample
Export—working sample

Procedures

- If the amount of excreta is not excessive, determine the kernel count.
- If the kernel count is excessive, determine the weight of excreta as a percentage of the net weight of the sample.

Fertilizer pellets (FERT PLTS)

Fertilizer pellets are typically either small, round and white or irregular shaped and pink or red. Fertilizer pellets are not considered a hazardous substance however there is no visible means of assuring that material resembling fertilizer pellets is not some other contaminant.

Representative portion for analysis

Minimum—1000 g
Optimum—1000 g
Export—1000 g

Procedures

- Handpick any fertilizer pellets and determine the concentration basis the net working sample.
- Fertilizer pellets are considered as a separate grading factor in all grades of domestic mustard seed.
  - Grades of domestic mustard seed may contain one fertilizer pellet in 1000 g, including samples of commercially clean mustard seed.
  - Samples containing one fertilizer pellet per 500 g up to 1.0% are graded *Domestic Mustard Seed, Sample Canada Oriental Account Fertilizer Pellets*.
  - Samples containing fertilizer pellets in excess of 1.0% of the net sample weight are graded *Domestic Mustard Seed, Held IP Suspect Contaminated Grain.*

Important: For samples between 500 and 1000 g – if the sample contains one fertilizer pellet, the sample grades *Domestic Mustard Seed, Sample Canada Oriental Account Fertilizer Pellets*. If the sample contains no fertilizer pellets, it is considered to be within the grade tolerance.

Note: Canadian Grain Commission personnel should refer to ISO national work instruction "*Suspect Contaminated Grain, Handling Procedures*" for specific procedures to be followed when handling samples containing fertilizer pellets.

Fireburnt kernels (FBNT)

Samples that show any evidence of being charred or scorched by fire are considered fireburnt. Evidence includes odour, pieces of charred wood, and so on. Fireburnt seeds pop when crushed.

Representative portion for analysis

Minimum—working sample

Optimum—working sample

Export—working sample

Procedures

Samples considered fireburnt are graded *Domestic Mustard Seed, Sample Canada Oriental Account Fireburnt.*

Frost

See *Damage.*

Green

See *Distinctly green.*

Heated kernels (HTD)

Heated refers only to seeds that are distinctly heated or badly binburnt. Heated seeds have a heated odour.

Crushed seeds may be

- Black—badly binburnt
- Dark chocolate brown—distinctly heated
- Light tan—slightly damaged from oxidation. If they have an odour or are present with brown or black crushed seeds, they are considered heated. Otherwise, they are included in *Total damage*, not heated.

Number of crushes (100-seed strips) for analysis

Minimum—5

Optimum—10

Export—10

Procedures

1. Examine 5 crushes for evidence of heating.
2. If no heated seeds detected, assess crushes for other damage. See *Damage.*
3. If at least 1 heated seed is detected, crush and assess an additional 5 crushes for heated seeds.

Inconspicuous admixture (INC ADMX)

In oriental mustard seed, inconspicuous admixture includes

- Canola
- Common wild mustard seed
- Any other seeds that blend with oriental mustard seed and are not readily identified

Representative portion for analysis

Minimum—5 g	Optimum—25 g	Export—5-25 g

▲ **Important:** Grain inspectors are authorized to withhold grades on samples with unidentifiable admixtures until results of anlayses are confirmed by seed analysts.

Mixed classes (MXD CL)

Samples are designated mixed classes when they contain sufficient quantities of other classes of mustard seed. See *Other classes.*

Odour (ODOR)

There is no numeric tolerance for odour. Consider

- The basic quality of the sample
- The type and degree of the odour
- The presence of visible residue causing the odour

Representative portion for analysis

Minimum—working sample	Optimum—working sample	Export—working sample

If odour is the grade determinant and there is . . .	Then the grade is . . .
A distinct objectionable odour not associated with the quality of the grain, but not heated or fireburnt	*Domestic Mustard Seed,Sample Canada Oriental, Account Odour*
A distinct heated odour	*Domestic Mustard Seed, Sample Canada Oriental, Account Heated*
A distinct fireburnt odour	*Domestic Mustard Seed, Sample Canada Orienta, Account Fireburnt*

Other classes (OCL)

Other classes of domestic mustard seed in oriental mustard seed are yellow or brown.

If a sample contains more than 10.0% other classes, it is designated *Mixed*. Mixed mustard seed is graded according to all specifications except other classes, as in *Mustard Seed, No. 1 Canada Mixed*.

Other class	Tolerance
Brown	Working tolerance for seeds with brown hulls • For Canada No. 1 Oriental, 2.0% • For Canada No. 2, 3, 4 Oriental, 5.0%
Yellow	Considered *Mixed* if sample contains more than 10.0% of yellow mustard seed

Representative portion for analysis

Minimum—2 g	Optimum—5 g	Export—2-5 g

Rime

Rime is the lining of the pod adhered to the seed. Seeds that are completely and densely covered with white rime are classed as damaged in any grade. Seeds with light rime sparsely covering the seed coat are

- Considered sound if not otherwise damaged
- Considered in the evaluation of colour. See *Colour*.

Representative portion for analysis

Minimum—5 g	Optimum—10 g	Export—10 g

Sclerotinia sclerotiorum (SCL)

Sclerotinia sclerotiorum is a fungus producing hard masses of fungal tissue, called *sclerotia*. The sclerotia vary in size and shape, have a course surface texture, vary in exterior color from dark black to gray to white and have a pure white interior.

Representative portion for analysis

Minimum—100 g	Optimum—500 g	Export—500 g

Soft earth pellets (SEP)

Soft earth pellets are

- Earth pellets that crumble into fine dust under light pressure, using a finger only—if they do not crumble, they are considered *Stones*.
- Any non-toxic material of similar consistency

▲ **Important:** In domestic mustard seed, fertilizer pellets are not considered soft earth pellets. See *Fertilizer pellets*.

Representative portion for analysis

Minimum—100 g	Optimum—working sample	Export—working sample

Stones (STNS)

Stones are hard shale, coal, hard earth pellets, and any other non toxic materials of similar consistency.

Note: Fertilizer pellets are **not** assessed as stones in samples of Domestic Mustard Seed. See *Fertilizer pellets.*

Representative portion for analysis

Minimum—100 g
Optimum—working sample
Export—working sample

Procedures

1. Handpick stones from a representative portion of the cleaned sample.
2. Determine stone concentration in the net sample.

- In western Canada samples of grain containing stones in excess of "basic grade" tolerances, up to 2.5% are graded *Domestic Mustard Seed, Rejected "basic grade" Account Stones*. The *"basic grade"* refers to a grade established in the Canada Grain Regulations (grades listed in the first column in grade determinant tables) that would have been assigned to the sample if it contained no stones.
- In eastern Canada samples of grain containing stones in excess of grade tolerances are degraded to lower grades. Samples containing stones in excess of the tolerance of the lowest grade established by regulation up to 2.5% are graded *Domestic Mustard Seed, Sample Canada Oriental Account Stones.*
- In western and eastern Canada grain containing more than 2.5% stones is graded *Domestic Mustard Seed, Sample Salvage.*

Examples: Western Canada

Excerpt from grade determinant tables for
Domestic Mustard Seed, Oriental, Canada

Grade name	Stones %
No. 1 Canada	0.05
No. 2 Canada	0.05
No. 3 Canada	0.05
No. 4 Canada	0.10

Basic grade:......................... *Domestic Mustard Seed,*
No. 2 Canada Oriental

Reason for basic grade:....... 2.0% Damage

If the above sample contained	Grade in western Canada
0.08% stones	*Domestic Mustard Seed,* *Rejected No. 2 Canada Oriental Account Stones*
1.0% stones	*Domestic Mustard Seed,* *Rejected No. 2 Canada Oriental Account Stones*
3.0% stones	*Domestic Mustard Seed, Sample Salvage*

Examples: Eastern Canada

Excerpt from grade determinant tables for
Domestic Mustard Seed, Oriental, Canada

Grade name	Stones %
No. 1 Canada	0.05
No. 2 Canada	0.05
No. 3 Canada	0.05
No. 4 Canada	0.10

Basic grade:......................... *Domestic Mustard Seed,*
No. 2 Canada Oriental

Reason for basic grade:....... 2.0% Damage

If the above sample contained	Grade in eastern Canada
0.08% stones	*Domestic Mustard Seed, No. 4 Canada Oriental*
1.0% stones	*Domestic Mustard Seed,* *Sample Canada Oriental Account Stones*
3.0% stones	*Domestic Mustard Seed, Sample Salvage*

Treated seed and other chemical substances

Treated seed

Treated seed is grain that has been coated with an agricultural chemical for agronomic purposes. These seed dressings contain a dye to render the treated seed visually conspicuous. The colour of the dye varies depending upon the type of treatment and the type of grain. The current Canadian colour standards for pesticide seed treatments are: cereals–pink or red, canola–baby blue or green. Seed treated with an inoculant may have a green stain. The coatings or stains may appear greasy or powdery and surface area distribution ranges from tiny flecks to complete coverage.

Other chemical substances

Other chemical substances refers to any chemical residues either adhering to the kernel or remaining in the sample and to samples having a chemical odour of any kind.

▲ **Important:** Wear gloves and a mask to handle any samples that you suspect may contain contaminated grain.

Representative portion for analysis

Minimum—working sample
Optimum—working sample
Export—working sample

If a sample is suspected of being coated with a pesticide, desiccant, inoculant or if the sample contains evidence of any foreign chemical substance other than fertilizer pellets, the sample shall be graded *Domestic Mustard Seed, Sample Canada Oriental Held IP Suspect Contaminated Grain*.

Note: Canadian Grain Commission personnel should refer to ISO national work instruction "*Suspect Contaminated Grain, Handling Procedures*" for specific procedures to be followed when handling samples suspected of containing treated seed or other chemical substances.

Variety (VAR)

Domestic mustard seed is graded without reference to variety.

Wild mustard (WM)

Wild mustard seeds are classed as *Inconspicuous admixture*.

Representative portion for analysis

Minimum—5 g
Optimum—25 g
Export—5-25 g

▲ **Important:** Grain inspectors are authorized to withhold grades on samples with unidentifiable admixtures until results of analyses are confirmed by seed analysts.

Primary and export grade determinants tables

Domestic Mustard Seed, Oriental, Canada (CAN)

	Standard of quality		Damage		
Grade name	Degree of soundness	Other classes %	Distinctly green %	Heated %	Total %
No. 1 Canada	Reasonably well matured, sweet, good natural colour	0.5	1.5	0.10	1.5
No. 2 Canada	Fairly well matured, sweet, reasonably good colour	2	1.5	0.20	3
No. 3 Canada	May have the natural odour associated with low-quality seed not any odour that would indicate serious deterioration	5	3.5	0.5	5
No. 4 Canada	May have the natural odour associated with low-quality seed not any odour that would indicate serious deterioration	10	3.5	1	10
Grade, if No. 4 specs not met		Over 10%—use all other grading criteria and grade as *Domestic Mustard Seed (grade) Mixed*	*Domestic Mustard Seed, Sample Canada Oriental Account Damaged*	*Domestic Mustard Seed, Sample Canada Oriental Account Heated*	*Domestic Mustard Seed, Sample Canada Oriental Account Damaged*

		Conspicuous inseparable seeds							
		Distinctly detrimental							
Grade name	Inconspicuous admixture %	Cow cockle %	Sclerotinia %	Total distinctly detrimental %	Total %	Ergot %	Excreta %	Soft earth pellets %	Stones %
No. 1 Canada	0.5	0.10	0.10	0.10	0.3	0.05	1 K	0.01	0.05
No. 2 Canada	1.0	0.20	0.20	0.20	0.5	0.05	1 K	0.20	0.05
No. 3 Canada	1.0	0.3	0.3	0.3	0.7	0.05	1 K	0.3	0.05
No. 4 Canada	1	1	1	1	3	0.05	0.005	1	0.1
Grade, if No. 4 specs not met	*Domestic Mustard Seed, Sample Canada Oriental Account Admixture*					*Domestic Mustard Seed, Sample Canada Oriental Account Ergot*	*Domestic Mustard Seed, Sample Canada Oriental Account Excreta*	*Domestic Mustard Seed, Sample Canada Oriental Account Admixture*	2.5% or less—*Domestic Mustard Seed, Rejected (grade) Oriental Account Stones*, or *Domestic Mustard Seed, Sample Canada Oriental Account Stones* Over 2.5%—*Domestic Mustard Seed, Sample Salvage*

K Number of kernel-sized pieces in 500 g

Note: The class, whether yellow, oriental, brown or mixed, is added to the grade name.

Grading—Domestic Mustard Seed, Yellow

Representative portion of domestic mustard seed, yellow for grading, grams

Grading factor	Minimum	Optimum	Export
Canola	5	25	5-25
Cockle	5	50	5-50
Colour	working sample	working sample	working sample
Conspicuous admixture	5	50	5-50
Damage	5	10	10
Distinctly detrimental	5	50	5-50
Distinctly green	5 crushes	10 crushes	10 crushes
Ergot	100	500	500
Excreta	working sample	working sample	working sample
Fertilizer pellets	1000	1000	1000
Fireburnt	working sample	working sample	working sample
Heated	5 crushes	10 crushes	10 crushes
Odour	working sample	working sample	working sample
Other classes	2	5	2-5
Other distinctly detrimental seeds	5	50	5-25
Rime	5	10	10
Sclerotinia sclerotiorum	100	500	500
Soft earth pellets	100	working sample	working sample
Stones	100	working sample	working sample
Wild mustard seed	5	25	5-25

Grading factors

Canola (CNL)

In yellow mustard seed, canola is classed as *Distinctly detrimental.*

▲ **Important:** Grain inspectors are authorized to withhold grades on samples with unidentifiable admixtures until results of analyses are confirmed by seed analysts.

Representative portion for analysis

Minimum—5 g	Optimum—25 g	Export—5-25 g

Classes

Domestic mustard seed is classed as yellow, brown or oriental, or mixed. The class forms part of the grade name; for example, *Domestic Mustard Seed, Sample Canada Yellow, Account Heated*. For a description of classes, see *Identifying classes of domestic mustard seed*

Cockle (COC)

Cockle, or cow cockle, is a hard roundish seed with a dull surface covered with numerous small bumps giving the seed a rough spiky appearance. Colour can be deep black, bluish-black or orangish-brown. In yellow mustard seed, cockle is considered *Distinctly detrimental* and included in *Total conspicuous inseparable seeds.*

Representative portion for analysis

Minimum—5 g	Optimum—50 g	Export—5-50 g

Procedures

Use a microscope to examine the sample.

Colour (CLR)

In analysing colour, consider

- The general degree of maturity
- The amount and degree of discolouration, such as from weathering
- The proportion of damaged seeds, which are distinctly green or otherwise colour-damaged. See *Damage* and *Distinctly green.*
- The amount of dried white mucilage on yellow mustard seed—light or sparse mucilage is considered in the overall appearance of the sample. See *Damage.*

Representative portion for analysis

Minimum—working sample	Optimum—working sample	Export—working sample

Conspicuous admixture (CADMX)

Conspicuous admixture is called *Conspicuous inseparable seeds* in the grade determinants tables. In yellow mustard seed, conspicuous admixture includes

- Seeds and foreign material designated as distinctly detrimental. See *Distinctly detrimental*
- Small seeds and broken kernels of other grains
- Weed seeds such as pigweed, lady's-thumb, lamb's-quarters and smartweed
- Any conspicuous foreign material except stones and soft earth pellets

Representative portion for analysis

Minimum—5 g	Optimum—50 g	Export—5-50 g

▲ **Important:** Grain inspectors are authorized to withhold grades on samples with unidentifiable admixtures until results of anlayses are confirmed by seed analysts.

Contaminated grain

▲ **Important:** Wear gloves and a mask to handle any sample that is suspected of containing contaminated grain.

Contaminated is defined in the *"Canada Grain Act"* as; "Contaminated means, in respect of grain, containing any substance in sufficient quantity that the grain is unfit for consumption by persons or animals or is adulterated within the meaning of the regulations made pursuant to sections B.01.046(1), B.15.001 and B.15.002(1) of the *Food and Drugs Act*."

Samples deemed to be contaminated by the Grain Research Laboratory in consultation with the Chief Grain Inspector for Canada are graded *Domestic Mustard Seed, Sample Canada Yellow Condemned.*

Damage (DMG)

Damaged seeds include those that are

- Distinctly shrunken or shrivelled
- Badly discoloured from mould
- Completely and densely covered with rime or dried white mucilage. See *Colour.*
- Excessively weathered, sprouted, distinctly green, heated or otherwise damaged

Representative portion for analysis

Minimum—5 g Optimum—10 g Export—10 g

Number of crushes (100-seed strips) for analysis

Minimum—5 Optimum—10 Export—10

Procedures

1. Handpick the representative portion to determine the content of visually damaged seeds.
2. Determine the percentage by weight.
3. Crush the appropriate number of strips from the portion remaining.
   A crush is made with only one pass of the roller under firm pressure.
4. Convert the count of damaged seeds on the strip to percentage by weight. Add this percentage of visually damaged seeds and crushed seeds for *Total damage*.

Distinctly detrimental (DDET)

Admixtures considered distinctly detrimental in yellow mustard seed include

- Cow cockle
- Sclerotinia
- Wild mustard, canola/rapeseed
- Other distinctly detrimental seeds (see *Other distinctly detrimental seeds*)
    - Ball mustard
    - Cleavers
    - Cockle
    - Dog mustard
    - Hare's ear mustard
    - Stinkweed or pennycress
    - Tansy mustard
    - Tumbling mustard
    - Wild buckwheat
    - Wormseed mustard

There are separate distinctly detrimental tolerances for cow cockle, sclerotinia and wild mustard in combination with canola or rapeseed and other distinctly detrimental seeds. All listed are included in the total of distinctly detrimental and total of conspicuous inseparable seeds.

Representative portion for analysis

Minimum—5 g Optimum—50 g Export—5-50 g

Distinctly green (DGR)

Distinctly green tolerances are applied to crushed seeds which are a distinct green throughout. Pale green or immature seeds are taken into account in the evaluation of colour. See *Colour*.

Number of crushes (100-seed strips) for analysis

Minimum—5
Optimum—10
Export—10

Procedures

See *Damage*.

Earth pellets (EP)

- Hard earth pellets are pellets that do not crumble under light pressure. See *Stones*.
- Soft earth pellets are pellets that crumble under light pressure. See *Soft earth pellets*.

Ergot (ERG)

Ergot is a plant disease producing elongated fungus bodies with a purplish-black exterior, a purplish-white to off white interior, and a relatively smooth surface texture.

Representative portion for analysis

Minimum—100 g
Optimum—500 g
Export—500 g

Excreta (EXCR)

▲ **Important:** Wear gloves and a mask to handle any samples that you suspect may contain excreta.

Representative portion for analysis

Minimum—working sample
Optimum—working sample
Export—working sample

Procedures

- If the amount of excreta is not excessive, determine the kernel count.
- If the kernel count is excessive, determine the weight of excreta as a percentage of the net weight of the sample.

Fertilizer pellets (FERT PLTS)

Fertilizer pellets are typically either small, round and white or irregular shaped and pink or red. Fertilizer pellets are not considered a hazardous substance however there is no visible means of assuring that material resembling fertilizer pellets is not some other contaminant.

Representative portion for analysis

Minimum—1000 g	Optimum—1000 g	Export—1000 g

Procedures

- Handpick any fertilizer pellets and determine the concentration basis the net working sample.
- Fertilizer pellets are considered as a separate grading factor in all grades of domestic mustard seed.
    - Grades of domestic mustard seed may contain one fertilizer pellet in 1000 g, including samples of commercially clean mustard seed.
    - Samples containing one fertilizer pellet per 500 g up to 1.0% are graded *Domestic Mustard Seed, Sample Canada Yellow Account Fertilizer Pellets.*
    - Samples containing fertilizer pellets in excess of 1.0% of the net sample weight are graded *Domestic Mustard Seed, Held IP Suspect Contaminated Grain.*

Important: For samples between 500 and 1000 g – if the sample contains one fertilizer pellet, the sample grades *Domestic Mustard Seed, Sample Canada Yellow Account Fertilizer Pellets*. If the sample contains no fertilizer pellets, it is considered to be within the grade tolerance.

Note: Canadian Grain Commission personnel should refer to ISO national work instruction "*Suspect Contaminated Grain, Handling Procedures*" for specific procedures to be followed when handling samples containing fertilizer pellets.

Fireburnt kernels (FBNT)

Samples that show any evidence of being charred or scorched by fire are considered fireburnt. Evidence includes odour, pieces of charred wood, and so on. Fireburnt seeds pop when crushed.

Representative portion for analysis

Minimum—working sample	Optimum—working sample	Export—working sample

Procedures

Samples considered fireburnt are graded *Domestic Mustard Seed, Sample Canada Yellow Account Fireburnt.*

Frost

See *Damage.*

Green

See *Distinctly green.*

Heated kernels (HTD)

Heated refers only to seeds that are distinctly heated or badly binburnt. Heated seeds have a heated odour.

Crushed seeds may be
- Black—badly binburnt
- Dark chocloate brown—distinctly heated
- Light tan—slightly damaged from oxidation. If they have an odour or are present with brown or black crushed seeds, they are considered heated. Otherwise, they are included in *Total damage*, not heated.

Number of crushes (100-seed strips) for analysis

Minimum—5	Optimum—10	Export—10

Procedures

1. Examine 5 crushes for evidence of heating.
2. If no heated seeds detected, assess crushes for other damage. See *Damage*.
3. If at least 1 heated seed is detected, crush and assess an additional 5 crushes for heated seeds.

Mixed classes (MXD CL)

Samples are designated mixed classes when they contain sufficient quantities of other classes of mustard seed. See *Other classes*.

Odour (ODOR)

There is no numeric tolerance for odour. Consider
- The basic quality of the sample
- The type and degree of the odour
- The presence of visible residue causing the odour

Representative portion for analysis

Minimum—working Sample	Optimum—working sample	Export—working sample

If odour is the grade determinant and there is . . .	**Then the grade is . . .**
A distinct objectionable odour not associated with the quality of the grain, but not heated or fireburnt	*Domestic Mustard Seed,Sample Canada Yellow, Account Odour*
A distinct heated odour	*Domestic Mustard Seed, Sample Canada Yellow, Account Heated*
A distinct fireburnt odour	*Domestic Mustard Seed, Sample Canada Yellow, Account Fireburnt*

Other classes (OCL)

Other classes of domestic mustard seed in yellow mustard seed are brown and oriental mustard seed.

If a sample contains more than 10.0% other classes, it is designated *Mixed*. Mixed mustard seed is graded according to all specifications except other classes, as in *Mustard seed, No. 1 Canada Mixed*.

Representative portion for analysis
Minimum—2 g Optimum—5 g Export—2-5 g

Other distinctly detrimental seeds (ODDET)

In yellow domestic mustard seed, the seeds listed below are considered *Other distinctly detrimental seeds*.

Ball mustard
Cleavers
Cockle
Dog mustard
Hare's ear mustard
Stinkweed or pennycress
Tansy mustard
Tumbling mustard
Wild buckwheat
Wormseed mustard

▲ **Important:** Grain inspectors are authorized to withhold grades on samples with unidentifiable admixtures until results of analysis are confirmed by seed analysts.

Representative portion for analysis
Minimum—5 g Optimum—25 g Export—5-25 g

Rime

Rime is the lining of the pod adhered to the seed. Seeds that are completely and densely covered with white rime are classed as damaged in any grade. Seeds with light rime sparsely covering the seed coat are

- Classed as sound if not otherwise damaged
- Considered in the evaluation of colour. See *Colour*.

Representative portion for analysis
Minimum—5 g Optimum—10 g Export—10 g

Sclerotinia sclerotiorum (SCL)

Sclerotinia sclerotiorum is a fungus producing hard masses of fungal tissue, called *sclerotia*. The sclerotia vary in size and shape, have a course surface texture, vary in exterior color from dark black to gray to white and have a pure white interior.

Representative portion for analysis
Minimum—100 g Optimum—500 g Export—500 g

Soft earth pellets (EP)

Soft earth pellets are

- Earth pellets that crumble into fine dust under light pressure, using a finger only—if they do not crumble, they are considered *Stones*.
- Any non-toxic material of similar consistency

▲ **Important:** In domestic mustard seed, fertilizer pellets are not considered soft earth pellets. See *Fertilizer pellets*.

Representative portion for analysis

Minimum	Optimum	Export
100 g	working sample	working sample

Stones (STNS)

Stones are hard shale, coal, hard earth pellets, and any other non toxic materials of similar consistency.

Note: Fertilizer pellets are **not** assessed as stones in samples of Domestic Mustard Seed. See *Fertilizer pellets*.

Representative portion for analysis

Minimum	Optimum	Export
100 g	working sample	working sample

Procedures

1. Handpick stones from a representative portion of the cleaned sample.
2. Determine stone concentration in the net sample.

- In western Canada samples of grain containing stones in excess of "basic grade" tolerances, up to 2.5% are graded *Domestic Mustard Seed, Rejected "basic grade" Account Stones*. The "*basic grade*" refers to a grade established in the Canada Grain Regulations (grades listed in the first column in grade determinant tables) that would have been assigned to the sample if it contained no stones.
- In eastern Canada samples of grain containing stones in excess of grade tolerances are degraded to lower grades. Samples containing stones in excess of the tolerance of the lowest grade established by regulation up to 2.5% are graded *Domestic Mustard Seed, Sample Canada Yellow Account Stones*.
- In western and eastern Canada grain containing more than 2.5% stones is graded *Domestic Mustard Seed, Sample Salvage*.

Examples: Western Canada

Excerpt from grade determinant tables for
Domestic Mustard Seed, Yellow, Canada

Grade name	Stones %
No. 1 Canada	0.05
No. 2 Canada	0.05
No. 3 Canada	0.05
No. 4 Canada	0.10

Basic grade:........................ *Domestic Mustard Seed,*
No. 2 Canada Yellow
Reason for basic grade:....... 2.0% Heated

If the above sample contained	Grade in western Canada
0.08% stones	*Domestic Mustard Seed, Rejected No. 2 Canada Yellow Account Stones*
1.0% stones	*Domestic Mustard Seed, Rejected No. 2 Canada Yellow Account Stones*
3.0% stones	*Domestic Mustard Seed, Sample Salvage*

Examples: Eastern Canada

Excerpt from grade determinant tables for
Domestic Mustard Seed, Yellow, Canada

Grade name	Stones %
No. 1 Canada	0.05
No. 2 Canada	0.05
No. 3 Canada	0.05
No. 4 Canada	0.10

Basic grade:........................ *Domestic Mustard Seed,*
No. 2 Canada Yellow
Reason for basic grade:....... 2.0% Heated

If the above sample contained	Grade in western Canada
0.08% stones	*Domestic Mustard Seed No. 4 Canada Yellow*
1.0% stones	*Domestic Mustard Seed, Sample Canada Yellow Account Stones*
3.0% stones	*Domestic Mustard Seed, Sample Salvage*

Treated seed and other chemical substances

Treated seed

Treated seed is grain that has been coated with an agricultural chemical for agronomic purposes. These seed dressings contain a dye to render the treated seed visually conspicuous. The colour of the dye varies depending upon the type of treatment and the type of grain. The current Canadian colour standards for pesticide seed treatments are: cereals–pink or red, canola–baby blue or green. Seed treated with an inoculant may have a green stain. The coatings or stains may appear greasy or powdery and surface area distribution ranges from tiny flecks to complete coverage.

Other chemical substances

Other chemical substances refers to any chemical residues either adhering to the kernel or remaining in the sample and to samples having a chemical odour of any kind.

▲ **Important:** Wear gloves and a mask to handle any samples that you suspect may contain contaminated grain.

Representative portion for analysis

Minimum—working sample	Optimum—working sample	Export—working sample

If a sample is suspected of being coated with a pesticide, desiccant, inoculant or if the sample contains evidence of any foreign chemical substance other than fertilizer pellets, the sample shall be graded *Domestic Mustard Seed, Sample Canada Yellow Held IP Suspect Contaminated Grain*.

Note: Canadian Grain Commission personnel should refer to ISO national work instruction "*Suspect Contaminated Grain, Handling Procedures*" for specific procedures to be followed when handling samples suspected of containing treated seed or other chemical substances.

Variety (VAR)

Domestic mustard seed is graded without reference to variety.

Wild mustard (WM)

In yellow mustard, wild mustard seeds are classed as *Distinctly detrimental*.

Representative portion for analysis

Minimum—5 g	Optimum—25 g	Export—5-25 g

▲ **Important:** Grain inspectors are authorized to withhold grades on samples with unidentifiable admixtures until results of analyses are confirmed by seed analysts.

Primary and export grade determinants tables

Domestic Mustard Seed, Yellow, Canada (CAN)

	Standard of quality		Damage		
Grade name	Degree of soundness	Other classes %	Distinctly green %	Heated %	Total %
No. 1 Canada	Reasonably well matured, sweet, good natural colour	0.5	1.5	0.10	1.5
No. 2 Canada	Fairly well matured, sweet, reasonably good colour	2	1.5	0.20	3
No. 3 Canada	May have the natural odour associated with low-quality seed not any odour that would indicate serious deterioration	5	3.5	0.5	5
No. 4 Canada	May have the natural odour associated with low-quality seed not any odour that would indicate serious deterioration	10	3.5	1	10
Grade, if No. 4 specs not met		Over 10%—use all other grading criteria and grade as *Domestic Mustard Seed (grade) Mixed*	*Domestic Mustard Seed, Sample Canada Yellow Account Damaged*	*Domestic Mustard Seed, Sample Canada Yellow Account Heated*	*Domestic Mustard Seed, Sample Canada Yellow Account Damaged*

	Conspicuous inseparable seeds									
	Distinctly detrimental									
Grade name	Cow cockle %	Sclerotinia %	Wild mustard, canola/ rapeseed %	Other distinctly detrimental %	Total distinctly detrimental %	Total %	Ergot %	Excreta %	Soft earth pellets %	Stones %
No. 1 Canada	0.10	0.10	0.10	0.10	0.10	0.3	0.05	1 K	0.01	0.05
No. 2 Canada	0.20	0.20	0.20	0.20	0.20	0.5	0.05	1 K	0.20	0.05
No. 3 Canada	0.3	0.3	0.3	0.3	0.3	0.7	0.05	1 K	0.3	0.05
No. 4 Canada	1	1	1	1	1	3	0.05	0.005	1	0.1
Grade, if No. 4 specs not met	*Domestic Mustard Seed, Sample Canada Yellow Account Admixture*						*Domestic Mustard Seed, Sample Canada Yellow Account Ergot*	*Domestic Mustard Seed, Sample Canada Yellow Account Excreta*	*Domestic Mustard Seed, Sample Canada Yellow Account Admixture*	2.5% or less—*Domestic Mustard Seed, Rejected (grade) Yellow Account Stones*, or *Domestic Mustard Seed, Sample Canada Yellow Account Stones* Over 2.5%—*Domestic Mustard Seed, Sample Salvage*

K Number of kernel-sized pieces in 500 g

Note: The class, whether yellow, oriental, brown or mixed, is added to the grade name

Export shipments

Export shipments can be commercially clean or not commercially clean.

Commercially clean

Shipments defined as commercially clean when the net dockage does not exceed 2.5% of the sample weight.

Dockage is reported to the nearest

- 0.1% for samples representing commercially clean shipments loaded from a single terminal or transfer elevator
- 0.01% for composite samples representing shipments loaded from more than one terminal or transfer elevator

A deduction for broken and reasonably sound mustard seed handpicked from the material and removed as dockage is allowed

- On shipments not for direct export, of up to 0.50%
- On shipments for direct export, of up to 0.75%

Not commercially clean (NCC)

Shipments that do not meet the standards for commercial cleanliness are referred to as not commercially clean. Such shipments are allowed only with the permission of the CGC.

For samples representing not commercially clean shipments approved by the CGC for shipment from terminal and transfer elevators, dockage is reported to the nearest

- 0.1% for samples representing commercially clean shipments loaded from a single terminal or transfer elevator
- 0.01% for composite samples representing shipments loaded from more than one terminal or transfer elevator

Instead of the allowances for broken seed in commercially clean shipments, a direct deduction of up to 0.2% is applied to establish net dockage.

Determination of dockage

Follow procedures for normal cleaning, with the Carter dockage tester set up as follows. You also need the No. .028 and No. .032 slotted hand sieves.

Setting	Export
Feed control	#3
Air control	#5
Riddle	No. 000
Top sieve	Blank tray
Centre sieve	None
Bottom sieve	None
Sieve cleaner control	Off

Composition of dockage

In export domestic mustard seed shipments, dockage consists of

- Material other than mustard which passes over the No. 000 riddle or remains ontop of the round-hole sieve
- Material that passes through the No. .028 or No. .032 slotted hand sieve, less the applicable allowance for broken or reasonably sound small whole mustard seed
- Material removed by aspiration

Grading

Domestic mustard seed on export is graded in accordance with export specifications. Where there are no export specifications, the primary specifications are used.

13. Buckwheat

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Determining the size of buckwheat

1. Using a Boerner-type divider, divide a representative portion of approximately 250 g from the cleaned sample.
2. Set up the Carter dockage tester as follows.

Feed control	#6
Air control	Off
Riddle	None
Top sieve	No. 8 slotted
Centre sieve	Blank tray
Bottom sieve	None
Sieve cleaner control	Off

3. Turn on the Carter dockage tester.
4. Pour the portion into the hopper.
5. Turn off the Carter dockage tester.
6. Determine the percentage by weight of the kernels passing through the No. 8 slotted sieve.

If the percentage of kernels passing through the No. 8 slotted sieve is . . .	**Then the buckwheat is . . .**
20.0 or less	Large
More than 20.0	Small

Determination of dockage

Definition

Dockage is assessed and recorded to the nearest 0.1%.

Dockage is defined under the Canada Grain Act as "any material intermixed with a parcel of grain, other than kernels of grain of a standard of quality fixed by or under this Act for a grade of that grain, that must and can be separated from the parcel of grain before that grade can be assigned to the grain." Dockage is removed by following the cleaning procedures described in this section of the guide.

The sample as it arrives is referred to as the uncleaned or dirty sample. Its weight is the **gross weight** of the sample. Dockage is assessed on the gross weight of the sample.

Dockage is assessed in two stages.

1. Follow *Normal cleaning procedures,* using the Carter dockage tester.
2. Follow procedures for *Cleaning for grade improvement.* This cleaning can be done at any time after normal cleaning has been completed.

Dockage not reported

▲ **Important:** Dockage is not reported for

- *Buckwheat, Sample Canada (size) Account Fireburnt*
- *Buckwheat, Sample Salvage*
- *Buckwheat, Sample Condemned*

Assessing dockage in small buckwheat

Normal cleaning procedures

▲ **Important:** Wear gloves and a mask to handle any samples that you suspect may contain hazardous substances.

Buckwheat is considered small when more than 20.0% of the kernels pass through the No. 8 slotted sieve.

1. Set up the Carter dockage tester as follows:

Feed control	#6
Air control	#6
Riddle	No. 25
Top sieve	No. 6 buckwheat
Centre sieve	No. 5 buckwheat
Bottom sieve	No. 5 buckwheat
Sieve cleaner control	Off

2. Using a Boerner-type divider, divide the uncleaned sample to obtain a representative portion.
   - Official samples should be at least 900 grams.
   - Unofficial samples must be at least 750 grams.
3. Turn on the Carter dockage tester.
4. Pour the sample into the hopper.
5. After the sample has passed through the machine, turn on the sieve cleaner control briefly to dislodge kernels.
6. Turn off the Carter dockage tester.
7. Snap the retainer rod of the aspiration pan lightly to loosen material gathered on the screen.
8. Determine dockage, using the list under *Composition of dockage*.

Composition of dockage

- Material other than whole kernels of buckwheat removed by the No. 25 riddle
- Material removed through the bottom No. 5 buckwheat sieve
- Material removed by aspiration other than whole kernels of buckwheat
- Soft earth pellets handpicked from the clean sample
- Material removed by cleaning for grade improvement

Cleaning for grade improvement

If the grade of a delivery can be improved by additional cleaning, perform the cleaning and add the additional material to dockage. Cleaning for grade improvement can be done at any time after normal cleaning.

1. After normal cleaning, examine the material to be removed and select your equipment according to the material you want to remove. See the table for the list of equipment.
2. Sieve the sample by hand using the No. 6 buckwheat hand sieve.

▲ **Important:** When you use a hand sieve, move the sieve from left to right 30 times, using a sifting motion. One time is one complete motion from the centre, to one side, to the other side, and back to the centre. The total distance from left to right is 20 cm, or about eight inches.

3. Weigh the additional dockage and add it to the original dockage.

Cleaning for grade improvement—Small buckwheat

Material to be removed	Equipment	Effect on composition of dockage
Foreign material	No. 6 buckwheat hand sieve	The material passing through the sieve is included in the dockage

Assessing dockage in large buckwheat

Normal cleaning procedure

▲ **Important:** Wear gloves and a mask to handle any samples that you suspect may contain hazardous substances.

Buckwheat is considered large when 20.0% or less of the kernels pass through the No. 8 slotted sieve.

1. Set up the Carter dockage tester as follows:

Feed control	#7
Air control	#6
Riddle	None
Top sieve	No. 15 round-hole
Centre sieve	No. 6 slotted
Bottom sieve	Blank tray
Sieve cleaner control	On

2. Using a Boerner-type divider, divide the uncleaned sample to obtain a representative portion.
   - Official samples should be at least 900 grams.
   - Unofficial samples must be at least 750 grams.
3. Turn on the Carter dockage tester.
4. Pour the sample into the hopper.
5. Turn off the Carter dockage tester.
6. Determine dockage, using the list under *Composition of dockage*.

Composition of dockage

- Material other than whole kernels of buckwheat passing over the No. 15 round-hole sieve
- Material passing through the No. 6 slotted sieve
- Material removed by aspiration other than whole kernels of buckwheat
- Soft earth pellets handpicked from the cleaned sample
- Material removed by cleaning for grade improvement

Cleaning for grade improvement

If the grade of a delivery can be improved by additional cleaning, perform the cleaning and add the additional material to dockage. Cleaning for grade improvement can be done at any time after normal cleaning.

1. After normal cleaning, examine the material to be removed and select your equipment according to the material you want to remove. See the table for the list of equipment.
2. Sieve the sample by hand using the No. 8 slotted hand sieve.

   ▲ **Important:** When you use a hand sieve, move the sieve from left to right 30 times, using a sifting motion. One time is one complete motion from the centre, to one side, to the other side, and back to the centre.The total distance from left to right is 20 cm, or about eight inches.

3. Weigh the additional dockage and add it to the original dockage.

Cleaning for grade improvement—Large buckwheat

Material to be removed	Equipment	Effect on composition of dockage
Foreign material	No. 8 slotted hand sieve	The material passing through the sieve is included in the dockage

Assessing dockage in processed large buckwheat

Processed buckwheat is buckwheat that

- Has been cleaned at a seed cleaning plant before being delivered to terminal or transfer elevators
- Contains the type of foreign material usually found after commercial cleaning, such as attritional material

Samples may contain foreign material such as Tartary buckwheat and barley.

Normal cleaning procedure

▲ **Important:** Wear gloves and a mask to handle any samples that you suspect may contain hazardous substances.

1. Set up the Carter dockage tester as follows:

Feed control	#6
Air control	#3
Riddle	None
Top sieve	No. 6 slotted
Centre sieve	No. 4.5 round-hole
Bottom sieve	Blank tray
Sieve cleaner control	Off

2. Using a Boerner-type divider, divide the uncleaned sample to obtain a representative portion.
    - Official samples should be at least 900 grams.
    - Unofficial samples must be at least 750 grams.
3. Turn on the Carter dockage tester.
4. Pour the sample into the hopper.
5. Turn off the Carter dockage tester.
6. Return all whole domestic buckwheat removed by aspiration to the cleaned sample.
7. Determine dockage, using the list under *Composition of dockage*.

Composition of dockage

- Material removed through the No. 4.5 round-hole sieve. Deduct up to 0.3% for fine attritional material. For example, if 0.95% of material is removed, record the amount as 0.65%.
- Buckwheat hulls and other material removed by aspiration, and material remaining on top of the #6 slotted sieve. Deduct up to 0.5% for broken or hulled buckwheat.
- Foreign material such as weed seeds, broken grain and roughage handpicked from the cleaned sample

Cleaning for grade improvement

Grade improvement procedures do not apply to samples of processed domestic buckwheat.

Optional analysis

Where a shipper requests special cleaning of a carlot of grain at a terminal or transfer elevator, and the elevator manager agrees, dockage material will be analyzed for the presence of grain. The percentage and grade of any grain contained in the dockage will be reported and elevator stocks will be adjusted on the basis of the analysis. Agreement of the shipper and unload elevator must be conveyed to the CGC in writing prior to the analysis being performed.

Procedures

1. Analyze the official sample.
2. Record the following on inspection records:
   - The percentage by gross weight to the nearest 0.1% and the grade of buckwheat.
   - The percentage by gross weight to the nearest 0.1% and the grade of grain separable from dockage.
   - The percentage of dockage.

Example
95.0% Buckwheat, No. 1 CAN
4.0% Domestic Mustard Seed, No. 1 CAN Oriental
1.0% dockage

Grading

Important definitions

Net weight of sample

The sample after cleaning and removal of dockage is referred to as the cleaned sample. Its weight is the net weight of the sample. Percentages by weight for grading refer to percentages of the net weight.

Kernel counts (K)

A kernel count is the number of kernel-sized pieces in a 500 gram sample.

- To do kernel counts, you must have 500 g of cleaned sample.
- All grading is done on representative portions divided down from the cleaned sample using a Boerner-type divider.

Hazardous substances in samples

Wear gloves and a mask to handle any samples that you suspect may contain hazardous substances. Hazardous substances are defined in the Regulations as "any pesticide, herbicide or desiccant."

Representative portion for grading

All grading is done on representative portions divided down from the cleaned sample, using a Boerner-type divider.

When concentration of the grading factor is . . .	**Then use . . .**
Low	Optimum portion size
High	Minimum portion or more **(do not use less)**

Values in the table represent a range of recommended portions of samples for grading.

Representative portion of buckwheat for grading, grams

Grading factor	**Minimum**	**Optimum**	**Export**
Cereal grains	50	**100**	250
Damage	25	**50**	50
Dehulled	10	**50**	50
Ergot	500	**1000**	1000
Excreta	working sample	**working sample**	working sample
Fireburnt	500	**working sample**	working sample
Immature	25	**50**	50
Matter other than cereal grains	50	**250**	250
Odour	working sample	**working sample**	working sample
Sclerotinia sclerotiorum	500	**1000**	1000
Size	250	**250**	250
Soft earth pellets	working sample	**working sample**	working sample
Stones	250	**500**	1000

Grading factors

Cereal grains (CGRN)

Cereal grains in buckwheat include wheat, rye, triticale, barley, oats and groats, including wild oat groats that remain in the clean sample.

Representative portion for analysis

Minimum—50 g	Optimum—100 g	Export—250 g

Contaminated grain

▲ **Important:** Wear gloves and a mask to handle any sample that is suspected of containing contaminated grain.

Contaminated is defined in the *"Canada Grain Act"* as; "Contaminated means, in respect of grain, containing any substance in sufficient quantity that the grain is unfit for consumption by persons or animals or is adulterated within the meaning of the regulations made pursuant to sections B.01.046(1), B.15.001 and B.15.002(1) of the *Food and Drugs Act*."

Samples deemed to be contaminated by the Grain Research Laboratory in consultation with the Chief Grain Inspector for Canada are graded *Buckwheat, Sample Condemned.*

Damage (DMG)

Damage includes all dehulled seeds and seeds that are frosted, mouldy, or otherwise unsound. The hull of damaged kernels collapses under pressure, as when rolled between the thumb and forefinger.

Representative portion for analysis

Minimum—25 g	Optimum—50 g	Export—50 g

Dehulled (DHULL)

Dehulled buckwheat is buckwheat with its hulls removed.

Representative portion for analysis

Minimum—10 g	Optimum—50 g	Export—50 g

Earth pellets (EP)

- Hard earth pellets are pellets that do not crumble under light pressure. See *Stones*.
- Soft earth pellets are pellets that crumble under light pressure. See *Soft earth pellets*.

Ergot (ERG)

Ergot is a plant disease producing elongated fungal bodies that have a purplish-black exterior, a purplish-white to off white interior, and a relatively smooth surface texture.

Representative portion for analysis

Minimum—500 g	Optimum—1000 g	Export—1000 g

Excreta (EXCR)

▲ **Important:** Wear gloves and a mask to handle any samples that you suspect may contain excreta.

Representative portion for analysis

Minimum—working sample
Optimum—working sample
Export—working sample

Fertilizer pellets (FERT PLTS)

Fertilizer pellets are typically either small, round and white or irregular shaped and pink or red. Fertilizer pellets are not considered a hazardous substance however there is no visible means of assuring that material resembling fertilizer pellets is not some other contaminant.

Representative portion for analysis

Minimum—working sample
Optimum—working sample
Export—working sample

Procedures

- Handpick any fertilizer pellets and determine the concentration basis the net working sample.
- Fertilizer pellets are assessed as stones when the concentration does not exceed 1.0% of the net sample weight.
- Samples containing fertilizer pellets in excess of 1.0% of the net sample weight are graded *Buckwheat, Held IP Suspect Contaminated Grain.*

Note: Canadian Grain Commission personnel should refer to ISO national work instruction "*Suspect Contaminated Grain, Handling Procedures*" for procedures to be followed when handling samples containing fertilizer pellets.

Fireburnt (FBNT)

Fireburnt samples are samples that contain kernels that show any evidence of being charred or scorched by fire.

Representative portion for analysis

Minimum—500 g
Optimum—working sample
Export—working sample

Immature (IM)

Immature kernels

- Do not contain a groat or have a severely shriveled groat
- Have a hull which collapses under pressure

Representative portion for analysis

Minimum—25 g
Optimum—50 g
Export—50 g

Matter other than cereal grains (MOTCG)

Matter other than cereal grains includes weed seeds and other grains that are not readily removable and may include peas, lentils, beans, corn, and other domestic or wild seeds that remain in the cleaned sample.

Representative portion for analysis

Minimum—50 g	Optimum—250 g	Export—250 g

Odour (ODOR)

There is no numeric tolerance for odour. Consider

- The basic quality of the sample
- The type and degree of the odour
- The presence of visible residue causing the odour

Representative portion for analysis

Minimum—working sample	Optimum—working sample	Export—working sample

If odour is the grade determinant and there is . . .	Then the grade is . . .
A distinct objectionable odour not associated with the quality of the grain, but not heated or fireburnt	*Buckwheat, Sample Canada (size) Account Odour*
A distinct heated odour	*Buckwheat, Sample Canada (size) Account Heated*
A distinct fireburnt odour	*Buckwheat, Sample Canada (size) Account Fireburnt*

Sclerotinia sclerotiorum (SCL)

Sclerotinia sclerotiorum is a fungus producing hard masses of fungal tissue, called *sclerotia*. The sclerotia vary in size and shape, have a course surface texture, vary in exterior color from dark black to gray to white and have a pure white interior.

Representative portion for analysis

Minimum—500 g	Optimum—1000 g	Export—1000 g

Size

Size is evaluated using a No. 8 slotted sieve. The size, large or small, is added to the grade name; for example, *Buckwheat, No. 1 Canada Large*.

If the percentage of kernels passing through the No. 8 slotted sieve is . . .	Then the buckwheat is . . .
20.0 or less	Large
More than 20.0	Small

Representative portion for analysis

Minimum—250 g	Optimum—250 g	Export—250 g

Soft earth pellets (SEP)

Soft earth pellets are

- Earth pellets that crumble into fine dust under light pressure, using a finger only— if they do not crumble, they are considered *Stones*.
- Any non-toxic material of similar consistency

Representative portion for analysis

Minimum—working sample
Optimum—working sample
Export—working sample

Procedures

1. Handpick soft earth pellets from a representative portion of the cleaned sample.
2. Soft earth pellets are removed as dockage. See *Composition of dockage*.

Stones (STNS)

Stones are hard shale, coal, hard earth pellets, and any other non toxic materials of similar consistency. Fertilizer pellets are assessed as stones when constituting 1.0% or less of the net sample weight. (See *Fertilizer pellets* for specific procedures to be followed when samples contain fertilizer pellets.)

Representative portion for analysis

Minimum—250 g
Optimum—500 g
Export—1000 g

Procedures

1. Handpick stones from a representative portion of the cleaned sample.
2. Determine stone concentration in the net sample.

- In western Canada samples of grain containing stones in excess of "basic grade" tolerances, up to 2.5% are graded *Buckwheat, Rejected "basic grade" Account Stones*. The "*basic grade*" refers to a grade established in the Canada Grain Regulations (grades listed in the first column in grade determinant tables) that would have been assigned to the sample if it contained no stones.
- In eastern Canada samples of grain containing stones in excess of grade tolerances are degraded to lower grades. Samples containing stones in excess of the tolerance of the lowest grade established by regulation up to 2.5% are graded *Buckwheat, Sample Canada Account Stones.*
- In western and eastern Canada grain containing more than 2.5% stones is graded *Buckwheat, Sample Salvage.*

Examples: Western Canada

Excerpt from grade determinant tables for
Buckwheat, Canada

Grade name	**Stones**
No. 1 Canada	3K
No. 2 Canada	3K
No. 3 Canada	3K

K Number of kernel-sized pieces in 500 g

Basic grade:.......................... *Buckwheat, No. 2 Canada Large*
Reason for basic grade:....... 2.0% Dehulled

If the above sample contained	**Grade in western Canada**
6K stones	*Buckwheat, Rejected No. 2 Canada Large Account Stones*
3.0% stones	*Buckwheat, Sample Salvage*

Examples: Eastern Canada

Excerpt from grade determinant tables for
Buckwheat, Canada

Grade name	**Stones**
No. 1 Canada	3K
No. 2 Canada	3K
No. 3 Canada	3K

K Number of kernel-sized pieces in 500 g

Basic grade:.......................... *Buckwheat, No. 2 Canada Large*
Reason for basic grade:....... 2.0% Dehulled

If the above sample contained	**Grade in eastern Canada**
6K stones	*Buckwheat, Sample Canada Large Account Stones*
3.0% stones	*Buckwheat, Sample Salvage*

Treated seed and other chemical substances

Treated seed

Treated seed is grain that has been coated with an agricultural chemical for agronomic purposes. These seed dressings contain a dye to render the treated seed visually conspicuous. The colour of the dye varies depending upon the type of treatment and the type of grain. The current Canadian colour standards for pesticide seed treatments are: cereals–pink or red, canola–baby blue or green. Seed treated with an inoculant may have a green stain. The coatings or stains may appear greasy or powdery and surface area distribution ranges from tiny flecks to complete coverage.

Other chemical substances

Other chemical substances refers to any chemical residues either adhering to the kernel or remaining in the sample and to samples having a chemical odour of any kind.

▲ **Important:** Wear gloves and a mask to handle any samples that you suspect may contain contaminated grain.

Representative portion for analysis

Minimum—working sample	Optimum—working sample	Export—working sample

If a sample is suspected of being coated with a pesticide, desiccant, inoculant or if the sample contains evidence of any foreign chemical substance other than fertilizer pellets, the sample shall be graded *Buckwheat, Held IP Suspect Contaminated Grain*.

Note: Canadian Grain Commission personnel should refer to ISO national work instruction "*Suspect Contaminated Grain, Handling Procedures*" for specific procedures to be followed when handling samples suspected of containing treated seed or other chemical substances.

Varieties

Any variety of buckwheat registered for production in Canada is eligible for the grade of No. 1 Canada.

Primary grade determinants tables

Buckwheat, Canada (CAN)

Grade name	Minimum test weight kg/hL (g/0.5 L)	Degree of soundness	Damage			Foreign material					
			Dehulled %	**Immature %**	**Total %**	**Cereal grains %**	**Ergot %**	**Matter other than cereal grains %**	**Sclerotinia %**	**Stones %**	**Total %**
No. 1 Canada	58 (285)	Cool and sweet	1	1.5	4	1	Nil	0.2	Nil	3K	1
No. 2 Canada	55 (270)	Cool and sweet	2	1.5	8	2.5	0.05	1	0.05	3K	3
No. 3 Canada	No minimum	May have a ground or grassy odour, not musty or sour	5	5	20	5	0.25	2	0.25	3K	5
Grade, if No. 3 specs not met			*Buckwheat, Sample Canada (size) Account Damage*			*Buckwheat, Sample Canada (size) Account Admixture*	*Buckwheat, Sample Canada (size) Account Ergot*	*Buckwheat, Sample Canada (size) Account Admixture*	*Buckwheat, Sample Canada (size) Account Admixture*	2.5% or less— *Buckwheat, Rejected (grade) (size) Account Stones*, or *Buckwheat, Sample Canada (size) Account Stones* Over 2.5%— *Buckwheat, Sample Salvage*	*Buckwheat, Sample Canada (size) Account Admixture*

K Number of kernel-sized pieces in 500 g

Note: The size may be added to the grade name

Export shipments

Export shipments can be commercially clean or not commercially clean.

Commercially clean

Shipments defined as commercially clean when the net dockage does not exceed 2.5% of the sample weight.

Any whole domestic buckwheat removed in dockage assessment is returned to the clean sample. Dockage in shipments is reduced by up to

- 0.3% for fine attritional material which passes through the No. 4.5 round-hole sieve
- 0.5% for broken or hulled buckwheat removed by aspiration or passing through the No. 5 buckwheat or the No. 6 slotted sieve

Not commercially clean (NCC)

Shipments that do not meet the standards for commercial cleanliness are referred to as *not commercially clean*. Such shipments are permitted only with the permission of the CGC.

For samples representing not commercially clean shipments approved by the CGC for shipment from terminal and transfer elevators, dockage is reported to the nearest

- 0.1% for samples representing commercially clean shipments loaded from a single terminal or transfer elevator
- 0.01% for composite samples representing shipments loaded from more than one terminal or transfer elevator

Instead of the allowance for broken seed in commercially clean shipments, a direct deduction of 0.2% is applied to establish net dockage.

Assessing dockage for small buckwheat

Follow the primary dockage assessment procedures, with the Carter dockage tester set as follows.

Feed control	#6
Air control	#3
Riddle	
Top sieve	No. 5 buckwheat
Centre sieve	No. 4.5 round-hole
Bottom sieve	Blank tray
Sieve cleaner control	

Dockage consists of the following:

- Material other than whole domestic buckwheat which passes through the No. 5 buckwheat or the No. 6 slotted sieve, less fine attritional material, broken or hulled buckwheat constituting not more than 0.5% of the sample by weight
- Material in excess of grade tolerances which is handpicked from the cleaned sample, other than cereal grains

Assessing dockage for large buckwheat

Follow the primary dockage assessment procedures, with the Carter dockage tester set as follows.

Feed control	#6
Air control	#3
Riddle	
Top sieve	No. 6 slotted
Centre sieve	No. 4.5 round-hole
Bottom sieve	Blank tray
Sieve cleaner control	

Dockage consists of the following

- Material other than whole domestic buckwheat that passes through the No. 6 slotted sieve, less fine attritional material, broken or hulled buckwheat constituting not more than 0.5% of the sample by weight
- Material in excess of grade tolerances which is removed by aspiration, other than whole domestic buckwheat
- Material in excess of grade tolerances which is handpicked from the cleaned sample, other than cereal grains

Grading

Buckwheat on export is graded in accordance with export grade specifications.

Export grade determinants tables

Buckwheat, Canada (CAN)

		Damage			Foreign material					
Grade name	Total removable material %	Dehulled %	Immature %	Total %	Cereal grains %	Ergot %	Matter other than cereal grains %	Sclerotinia %	Stones %	Total %
No. 1 Canada	2.5	1	1.5	4	1	Nil	0.2	Nil	3K	1
No. 2 Canada	2.5	2	1.5	8	2.5	0.05	1	0.05	3K	3
No. 3 Canada	2.5	5	5	20	5	0.25	2	0.25	3K	5

K Number of kernel-sized pieces in 500 g

14. Sunflower seed

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Determination of dockage

Definitions

Dockage is assessed and recorded to the nearest 0.1%.

Dockage is defined under the Canada Grain Act as "any material intermixed with a parcel of grain, other than kernels of grain of a standard of quality fixed by or under this Act for a grade of that grain, that must and can be separated from the parcel of grain before that grade can be assigned to the grain." Dockage is removed by following the cleaning procedures described in this section of the guide.

The sample as it arrives is referred to as the uncleaned or dirty sample. Its weight is the **gross weight** of the sample. Dockage is assessed on the gross weight of the sample.

Dockage not reported

▲ **Important:** Dockage is not reported for samples grading

- *Sunflower Seed, Sample Canada Account Fireburnt*
- *Sunflower Seed, Sample Salvage*
- *Sunflower Seed, Sample Condemned*

Normal cleaning procedures

▲ **Important:** Wear gloves and a mask to handle any samples that you suspect may contain hazardous substances.

1. Set up the Carter dockage tester as follows:

Feed control	#7 #9 for large-seeded varieties
Air control	#5 #7 for large-seeded varieties
Riddle	none
Top sieve	none
Centre sieve	blank tray
Bottom sieve	none
Sieve cleaner control	none

2. Using a Boerner-type divider, divide the uncleaned sample to obtain a representative portion.
    - Official samples should be at least 900 grams.
    - Unofficial samples must be at least 750 grams.
3. Sieve portions of approximately 250 grams at a time.

4. Nest the No. 24 or No. 18 round-hole sieve over one of the following sieves, depending on the size of the seeds:
    - the No. 10 round-hole sieve
    - the No. 6 buckwheat sieve
5. Pass through the Carter dockage tester the material which has passed through the No. 24 or No. 18 round-hole sieve and remains on top of the No. 10 round-hole sieve (or the No. 6 buckwheat sieve).
6. Using a Boerner-type divider, divide a portion of approximately 250-g.
7. Handpick the 250-g portion for foreign material, including broken hulls, which are assessed as dockage up to the established grade tolerances.
8. From the 250-g portion, determine the percentage by weight of foreign material.

    Note: The handpicked 250-g portion should be used to determine test weight.
9. Handpick from the material remaining on top of the No. 24 or No. 18 round-hole sieve all whole or broken sunflower seeds. Return them to the cleaned sample.
10. Determine dockage, using the list under *Composition of dockage.*

Composition of dockage

- Foreign material removed by either the No. 24 or No. 18 round-hole sieve
- Material removed by aspiration, except sound whole sunflower seeds
  Note: Very immature seeds containing no meats are not considered sound.
- Material passing through either the No. 10 round-hole sieve or the No. 6 buckwheat sieve
- Coarse material handpicked from the sieved sample
- Soft earth pellets and other grains handpicked from the sieved sample up to 2.5%
- Sclerotinia handpicked from the sieved sample up to 2%
  Note: In samples eligible for off-grades, other grains, sclerotinia and soft earth pellets are considered a grading factor and are not added to the dockage.

Optional analysis

Where a shipper requests special cleaning of a carlot of grain at a terminal or transfer elevator, and the elevator manager agrees, dockage material will be analyzed for the presence of grain. The percentage and grade of any grain contained in the dockage will be reported and elevator stocks will be adjusted on the basis of the analysis. Agreement of the shipper and unload elevator must be conveyed to the CGC in writing prior to the analysis being performed.

Procedures

1. Analyze the official sample.
2. Record the following on inspection records:
    - The percentage by gross weight to the nearest 0.1% and the grade of sunflower seed.
    - The percentage by gross weight to the nearest 0.1% and the grade of grain separable from dockage.
    - The percentage of dockage.

    Example
    95.0% Sunflower Seed, No. 1 CAN Confectionary
    4.0% Domestic Mustard Seed, No. 1 CAN Oriental
    1.0% dockage

Grading

Important definitions

Net weight of sample

The sample after cleaning and removal of dockage is referred to as the cleaned sample. Its weight is the net weight of the sample. Percentages by weight for grading refer to percentages of the cleaned sample, the net weight.

Kernel counts (K)

The kernel count is the number of kernel-sized pieces of foreign material in a sample.

- To do kernel counts, you must have 500 grams of cleaned sample.
- All grading is done on representative portions divided down from the cleaned sample using a Boerner-type divider.

Hazardous substances in samples

Wear gloves and a mask to handle any samples that you suspect may contain hazardous substances. Hazardous substances are defined in the Regulations sample as "any pesticide, herbicide or desiccant."

Representative portion sizes for grading

All grading is done on representative portions divided down from the cleaned sample, using a Boerner-type divider.

When the grading factor is . . .	Then use . . .
Normal	Optimum portion size
Severe	Minimum portion size or more (do not use less)

Values in this table represent a range of recommended portions of samples for grading.

Representative portion of sunflower seed for grading, grams

Grading factor	Minimum	Optimum	Export
Damage	100	**100**	100
Dehulled	500	**working sample**	working sample
Ergot	500	**working sample**	working sample
Excreta	working sample	**working sample**	working sample
Fireburnt	500	**working sample**	working sample
Heated, rotted, mouldy	100	**100**	100
Head rot (hulls)	25	**100**	100
Head rot (seeds)	5	**25**	25
Insect damage	100	**100**	100
Odour	working sample	**working sample**	working sample
Other grains	250	**250**	250
Sclerotinia sclerotiorum	250	**working sample**	working sample
Soft earth pellets	250	**working sample**	working sample
Stones	250	**500**	working sample
Very immature seeds	100	**100**	100

Grading factors

Contaminated grain

▲ **Important:** Wear gloves and a mask to handle any sample that is suspected of containing contaminated grain.

Contaminated is defined in the *"Canada Grain Act"* as; "Contaminated means, in respect of grain, containing any substance in sufficient quantity that the grain is unfit for consumption by persons or animals or is adulterated within the meaning of the regulations made pursuant to sections B.01.046(1), B.15.001 and B.15.002(1) of the *Food and Drugs Act*."

Samples deemed to be contaminated by the Grain Research Laboratory in consultation with the Chief Grain Inspector for Canada are graded *Sunflower Seed, Sample Condemned.*

Damage (DMG)

Damaged seeds show at least one of following characteristics:

- Head rot damage
- Heated, rotted or mouldy
- Very immature
- Insect-damaged
- Otherwise materially damaged

Representative portion for analysis

Minimum—100 g	Optimum—100 g	Export—100 g

Dehulled (DHULL)

Hulled seeds are broken and whole seeds that are without hulls.

Representative portion for analysis

Minimum—500 g	Optimum—working sample	Export—working sample

Earth pellets

- Hard earth pellets are pellets that do not crumble under light pressure. See *Stones.*
- Soft earth pellets are pellets that crumble under light pressure. See *Soft earth pellets.*

Ergot (ERG)

Ergot is a plant disease producing elongated fungal bodies that have a purplish-black exterior, a purplish-white to off white interior, and a relatively smooth surface texture.

Representative portion for analysis

Minimum—500 g	Optimum—working sample	Export—working sample

Excreta (EXCR)

▲ **Important:** Wear gloves and a mask to handle any samples that you suspect may contain excreta.

Representative portion for analysis

Minimum—working sample	Optimum—working sample	Export—working sample

Fertilizer pellets (FERT PLTS)

Fertilizer pellets are typically either small, round and white or irregular shaped and pink or red. Fertilizer pellets are not considered a hazardous substance however there is no visible means of assuring that material resembling fertilizer pellets is not some other contaminant.

Representative portion for analysis

Minimum—working sample	Optimum—working sample	Export—working sample

Procedures

- Handpick any fertilizer pellets and determine the concentration basis the net working sample.
- Fertilizer pellets are assessed as stones when the concentration does not exceed 1.0% of the net sample weight.
- Samples containing fertilizer pellets in excess of 1.0% of the net sample weight are graded *Sunflower Seed, Held IP Suspect Contaminated Grain.*

Note: Canadian Grain Commission personnel should refer to ISO national work instruction "*Suspect Contaminated Grain, Handling Procedures*" for procedures to be followed when handling samples containing fertilizer pellets.

Fireburnt (FBNT)

Fireburnt seeds are those that show any signs of being charred or scorched by fire.

Representative portion for analysis

Minimum—500 g	Optimum—working sample	Export—working sample

Foreign material (FM)

Foreign material in sunflower seed includes other grains, sclerotinia and stones.

Head rot damage

Head rot is damage most frequently caused by sclerotinia head rot disease.

Damage includes

- Hulls with 50% or more of the surface covered by white patches
- Seeds that are off colour, e.g., tan to dark brown
- Seeds that may contain small black sclerotia

Representative portion for analysis

Hulls
Minimum—25 g
Optimum—100 g
Exports—100 g

Seeds
Minimum—5 g
Optimum—25 g
Exports—25 g

Procedures

1. Using a Boerner-type divider, divide a representative portion for hulls.
2. Examine the portion and remove hulls with white patches covering 50% or more of the hull.
3. Divide the remaining representative portion for a subsample not less than 5 g.
4. Remove the hulls and examine the seeds for off-colour and the presence of sclerotia.

Heated, rotted or musty (HTD)

Heated seeds have the colour and or odour typical of seeds that have heated in storage or have been damaged by artificial drying.

Representative portion for analysis

Minimum—100 g
Optimum—100 g
Export—100 g

Procedures

1. Pass the representative portion of the clean sample through a barley pearler for 3 to 5 seconds.
2. Separate heated, rotted or musty kernels from sound kernels.

If you are unsure whether the kernel is heated, rotted or musty, cut the seed lengthwise and examine the exposed meat. Brown-coloured meat is considered to be heated.

Insect damage (I DMG)

Insect-damaged seeds have hull perforations of any size caused by insects and include any hulled seeds which have been bored or chewed by insects.

Representative portion for analysis

Minimum—100 g
Optimum—100 g
Export—100 g

Odour (ODOR)

There is no numeric tolerance for odour. Consider

- The basic quality of the sample
- The type and degree of the odour
- The presence of visible residue causing the odour

Representative portion for analysis

Minimum	Optimum	Export
Minimum—working sample	Optimum—working sample	Export—working sample

If odour is the grade determinant and there is . . .	**Then the grade is . . .**
An excessive objectionable odour not associated with the quality of the grain, but not heated or fireburnt	*Sunflower, Sample Canada Account Odour*
An excessive heated odour	*Sunflower, Sample Canada Account Heated*
An excessive fireburnt odour	*Sunflower, Sample Canada Account Fireburnt*

Other grains (OGS)

Other grains are any other grains that are not removed during cleaning.

In samples eligible for off-grades, other grains are considered a grading factor and are not added to the dockage.

Representative portion for analysis

Minimum—250 g Optimum—250 g Export—250 g

Sclerotinia sclerotiorum (SCL)

Sclerotinia sclerotiorum is a fungus producing hard masses of fungal tissue, called *sclerotia*. The sclerotia vary in size and shape, have a course surface texture, vary in exterior color from dark black to gray to white and have a pure white interior.

In samples eligible for off-grades, sclerotia are considered a grading factor and are not added to the dockage.

Representative portion for analysis

Minimum—250 g Optimum—working sample Export—working sample

Soft earth pellets (SEP)

Soft earth pellets are pellets that crumble under light pressure from a finger—if they do not crumble, they are considered stones. These pellets can be

- Earth and fertilizer pellets
- Any non-toxic material of similar consistency

Procedures

Earth pellets may be removed as dockage. See *Normal cleaning procedures*.

In samples eligible for off-grades, soft earth pellets are considered a grading factor and are not added to the dockage.

1. Return the pellets to the sample.
2. Handpick soft earth pellets from a representative portion of 100 g of the cleaned sample.
3. If soft earth pellets is the grade determinant, grade the sample *Sunflower Seed, Sample Canada Account Admixture*.

Representative portion for analysis

Minimum—250g
Optimum— working sample
Export—working sample

Stones (STNS)

Stones are hard shale, coal, hard earth pellets, and any other non toxic materials of similar consistency. Fertilizer pellets are assessed as stones when constituting 1.0% or less of the net sample weight. (See *Fertilizer pellets* for specific procedures to be followed when samples contain fertilizer pellets.)

Representative portion for analysis

Minimum—250 g
Optimum—500 g
Export—working sample

Procedures

1. Handpick stones from a representative portion of the cleaned sample.
2. Determine stone concentration in the net sample.

- In western Canada samples of grain containing stones in excess of "basic grade" tolerances, up to 2.5% are graded *Sunflower Seed, Rejected "basic grade" Account Stones*. The "*basic grade*" refers to a grade established in the Canada Grain Regulations (grades listed in the first column in grade determinant tables) that would have been assigned to the sample if it contained no stones.
- In eastern Canada samples of grain containing stones in excess of grade tolerances are degraded to lower grades. Samples containing stones in excess of the tolerance of the lowest grade established by regulation up to 2.5% are graded *Sunflower Seed, Sample Canada Account Stones*.
- In western and eastern Canada grain containing more than 2.5% stones is graded *Sunflower Seed, Sample Salvage*.

Examples: Western Canada

Excerpt from grade determinant tables for
Sunflower Seed, Canada, Oil

Grade name	Stones
No. 1 Canada	3K
No. 2 Canada	3K

K Number of kernel-sized pieces in 500 g

Basic grade:.......................... *Sunflower Seed, No. 1 Canada, Oil*

If the above sample contained	Grade in western Canada
6K stones	*Sunflower Seed, Rejected No. 1 Canada Oil Account Stones*
3.0% stones	*Sunflower Seed, Sample Salvage*

Examples: Eastern Canada

Excerpt from grade determinant tables for
Sunflower Seed, Canada, Oil

Grade name	Stones
No. 1 Canada	3K
No. 2 Canada	3K

K Number of kernel-sized pieces in 500 g

Basic grade:.......................... *Sunflower Seed, No. 1 Canada, Oil*

If the above sample contained	Grade in eastern Canada
6K stones	
3.0% stones	*Sunflower Seed, Sample Salvage*

Treated seed and other chemical substances

Treated seed

Treated seed is grain that has been coated with an agricultural chemical for agronomic purposes. These seed dressings contain a dye to render the treated seed visually conspicuous. The colour of the dye varies depending upon the type of treatment and the type of grain. The current Canadian colour standards for pesticide seed treatments are: cereals–pink or red, canola–baby blue or green. Seed treated with an inoculant may have a green stain. The coatings or stains may appear greasy or powdery and surface area distribution ranges from tiny flecks to complete coverage.

Other chemical substances

Other chemical substances refers to any chemical residues either adhering to the kernel or remaining in the sample and to samples having a chemical odour of any kind.

▲ **Important:** Wear gloves and a mask to handle any samples that you suspect may contain contaminated grain.

Representative portion for analysis

Minimum—working sample	Optimum—working sample	Export—working sample

If a sample is suspected of being coated with a pesticide, desiccant, inoculant or if the sample contains evidence of any foreign chemical substance other than fertilizer pellets, the sample shall be graded *Sunflower Seed, Held IP Suspect Contaminated Grain*.

Note: Canadian Grain Commission personnel should refer to ISO national work instruction "*Suspect Contaminated Grain, Handling Procedures*" for specific procedures to be followed when handling samples suspected of containing treated seed or other chemical substances.

Varieties

Sunflower seed is graded according to end use, either confectionary or oil.

On written request, the name of the variety as described by the owner or shipper may be shown as a notation in the remarks section of a certificate; for example, Said to be Commander variety.

Very immature seeds (VIM SDS)

Very immature seeds are whole sunflower seeds that contain no meat.

Representative portion for analysis

Minimum—100 g	Optimum—100 g	Export—100 g

Procedures

1. Using a Boerner-type divider, divide a representative portion.
2. Separate whole shrunken seed kernels from sound kernels.
3. Determine the percentage of seeds that do not contain meat by either pressing the seed on a hard surface with finger pressure or by manually opening the seed.
4. Very immature seeds are included in the percentage of damaged seeds for grade determination.

Primary and export grade determinants tables

Sunflower Seed, Canada Confectionery (CAN)

	Standard of quality		Damage					Foreign material			
Grade name	**Minimum test weight (kg/hL)**	**Degree of soundness**	**Head rot %**	**Heated %**	**Insect damage %**	**Total %**	**Dehulled seeds %**	**Other grains %**	**Sclerotinia %**	**Soft earth pellets %**	**Stones**
No. 1 Canada	31 (155)	Well matured and sweet	2	0.5	2	4	5	2.5	1	2.5	3K
No. 2 Canada	29 (144.4)	Reasonably well matured and sweet	5	1	4	8	5	2.5	2	2.5	3K
Grade, if No. 2 specs not met	*Sunflower Seed, Sample Canada Account Light Weight*		*Sunflower Seed, Sample Canada Account Damage*	*Sunflower Seed, Sample Canada Account Heated*	*Sunflower Seed, Sample Canada Account Insect Damage*	*Sunflower Seed, Sample Canada Account Damaged*	*Sunflower Seed, Sample Canada Account Dehulled*	*Sunflower Seed, Sample Canada Account Admixture*	*Sunflower Seed, Sample Canada Account Admixture*	*Sunflower Seed, Sample Canada Account Admixture*	2.5% or less—*Sunflower Seed, Rejected (grade) Account Stones*, or *Sunflower Seed, Sample Canada Account Stones* Over 2.5%—*Sunflower Seed, Sample Salvage*

K Number of kernel-sized pieces in 500 g

Sunflower Seed, Canada Oil (CAN)

	Standard of quality		**Damage**					**Foreign material**			
Grade name	**Minimum test weight (kg/hL)**	**Degree of soundness**	**Head rot %**	**Heated %**	**Insect damage %**	**Total %**	**Dehulled seeds %**	**Other grains %**	**Sclerotinia %**	**Soft earth pellets %**	**Stones**
No. 1 Canada	35.0 (169)	Well matured and sweet	2	0.5	2	5	5	2.5	1	2.5	3K
No. 2 Canada	31.0 (148.4)	Reasonably well matured and sweet	5	1	4	10	5	2.5	2	2.5	3K
Grade, if No. 2 specs not met	*Sunflower Seed, Sample Canada Account Light Weight*		*Sunflower Seed, Sample Canada Account Damage*	*Sunflower Seed, Sample Canada Account Heated*	*Sunflower Seed, Sample Canada Account Insect Damage*	*Sunflower Seed, Sample Canada Account Damaged*	*Sunflower Seed, Sample Canada Account Dehulled*	*Sunflower Seed, Sample Canada Account Admixture*	*Sunflower Seed, Sample Canada Account Admixture*	*Sunflower Seed, Sample Canada Account Admixture*	2.5% or less—*Sunflower Seed, Rejected (grade) Account Stones*, or *Sunflower Seed, Sample Canada Account Stones* Over 2.5%—*Sunflower Seed, Sample Salvage*

K Number of kernel-sized pieces in 500 g

Export shipments

Export shipments can be commercially clean or not commercially clean.

Commercially clean (CC)

Shipments with dockage levels up to 5.0% are considered commercially clean.
Dockage is reported to the nearest

- 0.1% for samples representing commercially clean shipments loaded from a single terminal or transfer elevator
- 0.01% for composite samples representing shipments loaded from more than one terminal or transfer elevator

Not commercially clean (NCC)

Shipments that do not meet the standards for commercial cleanliness are referred to as not commercially clean. Such shipments are permitted only with the permission of the CGC.

For samples representing not commercially clean shipments approved by the CGC for shipment from terminal and transfer elevators, dockage is reported to the nearest

- 0.1% for samples representing commercially clean shipments loaded from a single terminal or transfer elevator
- 0.01% for composite samples representing shipments loaded from more than one terminal or transfer elevator

A direct deduction of up to 0.2% is applied to take into account the buildup of attritional material. Dockage is assessed using procedures for primary samples.

Grading

Sunflower seed on export is graded in accordance with primary grade standards and specifications

15. Safflower seed

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Determination of dockage

Definitions

Dockage is assessed and recorded to the nearest 0.1%.

Dockage is defined under the Canada Grain Act as "any material intermixed with a parcel of grain, other than kernels of grain of a standard of quality fixed by or under this Act for a grade of that grain, that must and can be separated from the parcel of grain before that grade can be assigned to the grain." Dockage is removed by following the cleaning procedures described in this section of the guide.

The sample as it arrives is referred to as the uncleaned or dirty sample. Its weight is the **gross weight** of the sample. Dockage is assessed on the gross weight of the sample.

Dockage not reported

▲ **Important:** Dockage is not reported for

- *Safflower Seed, Sample Canada Account Fireburnt*
- *Safflower Seed Sample Salvage*
- *Safflower Seed, Sample Condemned*

Normal cleaning procedures

▲ **Important:** Wear gloves and a mask to handle any samples that you suspect may contain hazardous substances.

1. Set up the Carter dockage tester as follows:

Feed control	#7
Air control	#7
Riddle	none
Top sieve	blank
Centre sieve	none
Bottom sieve	none
Sieve cleaner control	

2. Using a Boerner-type divider, divide the uncleaned sample to obtain a representative portion.
   - Official samples should be at least 900 grams.
   - Unofficial samples must be at least 750 grams.
3. Sieve portions of approximately 250 grams at a time.
4. Sift the sample over a No. 15 round-hole sieve nested over a No. 6 slotted sieve or a No. 6 buckwheat sieve or both, with a blank sieve on the bottom.
5. Turn on the Carter dockage tester.
6. Pour into the hopper the part of the sample that has passed through the No. 15 round-hole sieve.

7. From the material remaining on the top of the No. 15 round-hole sieve, handpick all whole or broken safflower seeds and return them to the cleaned sample.
8. Determine dockage, using the list that follows, under *Composition of dockage.*

Composition of dockage

- Foreign material removed by the No. 15 round-hole sieve
- Material removed by the No. 6 slotted, the No. 6 buckwheat sieve, or both
- Material removed by aspiration; except sound whole safflower seeds
- Soft earth pellets handpicked from the clean sample constituting up to 2.5% of the sample by weight—if the percentage of soft earth pellets is 2.5% or more, soft earth pellets becomes a grading factor.

Optional analysis

Where a shipper requests special cleaning of a carlot of grain at a terminal or transfer elevator, and the elevator manager agrees, dockage material will be analyzed for the presence of grain. The percentage and grade of any grain contained in the dockage will be reported and elevator stocks will be adjusted on the basis of the analysis. Agreement of the shipper and unload elevator must be conveyed to the CGC in writing prior to the analysis being performed.

Procedures

1. Analyze the official sample.
2. Record the following on inspection records:
    - The percentage by gross weight to the nearest 0.1% and the grade of safflower seed.
    - The percentage by gross weight to the nearest 0.1% and the grade of grain separable from dockage.
    - The percentage of dockage.

    Example
    95.0% Safflower Seed, No. 1 CAN
    4.0% Domestic Mustard Seed, No. 1 CAN Oriental
    1.0% dockage

Grading

Important definitions

Net weight of sample

The sample after cleaning and removal of dockage is referred to as the cleaned sample. Its weight is the net weight of the sample. Percentages by weight for grading refer to percentages of the cleaned sample, the net weight.

Kernel counts (K)

A kernel count is the number of kernel-sized pieces of a foreign material in 500 g of a sample.

- To do kernel counts you must have 500 grams of cleaned sample.
- All grading is done on representative portions divided down from the cleaned sample using a Boerner-type divider.

Hazardous substances in samples

Wear gloves and a mask to handle any samples that you suspect may contain hazardous substances. Hazardous substances are defined in the Regulations as "any pesticide, herbicide or desiccant."

Representative portion for grading

All grading is done on representative portions divided down from the cleaned sample, using a Boerner-type divider.

When the grading factor is . . .	Then use . . .
Normal	Optimum portion size
Severe	Minimum portion size or more **(do not use less)**

Values in the table represent a range of recommended portions sizes.

Representative portion of safflower seed for grading, grams

Grading factor	Minimum	Optimum	Export
Damage	100	**100**	100
Dehulled	100	**100**	100
Empty hulls	100	**250**	250
Excreta	working sample	**working sample**	working sample
Heated	100	**100**	100
Matter other than cereal grains	100	**250**	250
Odour	working sample	**working sample**	working sample
Other grains	100	**250**	250
Rotted	100	**100**	100
Soft earth pellets	100	**100**	100
Stones	250	**500**	1000

Grading factors

Contaminated grain

▲ **Important:** Wear gloves and a mask to handle any sample that is suspected of containing contaminated grain.

Contaminated is defined in the *"Canada Grain Act"* as; "Contaminated means, in respect of grain, containing any substance in sufficient quantity that the grain is unfit for consumption by persons or animals or is adulterated within the meaning of the regulations made pursuant to sections B.01.046(1), B.15.001 and B.15.002(1) of the *Food and Drugs Act.*"

Samples deemed to be contaminated by the Grain Research Laboratory in consultation with the Chief Grain Inspector for Canada are graded *Safflower Seed, Sample Condemned.*

Damage (DMGE)

Damaged seeds are frosted, green, broken, heated, insect-damaged or otherwise unsound.

Representative portion for analysis

Minimum—100 g	Optimum—100 g	Export—100 g

Dehulled (DHULL)

Intact safflower seeds are called "achenes" which consists of the hull containing the seed. Dehulled seeds are broken or whole seeds without hulls.

Representative portion for analysis

Minimum—100 g	Optimum—100 g	Export—100 g

Earth pellets (EP)

- Hard earth pellets are pellets that do not crumble under light pressure.
  See *Stones.*
- Soft earth pellets are pellets that crumble under light pressure.
  See *Soft earth pellets.*

Empty hulls (HULLS)

Intact safflower seeds are called "achenes" which consists of the hull containing the seed. Empty hulls are achenes with intact hulls but which contain no seeds. This also includes hulls having less than one-third of the seed attached.

Representative portion for analysis

Minimum—100 g	Optimum—250 g	Export—250 g

Excreta (EXCR)

▲ **Important:** Wear gloves and a mask to handle any samples that you suspect may contain excreta.

Representative portion for analysis

Minimum—working sample
Optimum—working sample
Export—working sample

Fertilizer pellets (FERT PLTS)

Fertilizer pellets are typically either small, round and white or irregular shaped and pink or red. Fertilizer pellets are not considered a hazardous substance however there is no visible means of assuring that material resembling fertilizer pellets is not some other contaminant.

Representative portion for analysis

Minimum—working sample
Optimum—working sample
Export—working sample

Procedures

- Handpick any fertilizer pellets and determine the concentration basis the net working sample.
- Fertilizer pellets are assessed as stones when the concentration does not exceed 1.0% of the net sample weight.
- Samples containing fertilizer pellets in excess of 1.0% of the net sample weight are graded *Safflower Seed, Held IP Suspect Contaminated Grain.*

Note: Canadian Grain Commission personnel should refer to ISO national work instruction "*Suspect Contaminated Grain, Handling Procedures*" for procedures to be followed when handling samples containing fertilizer pellets.

Foreign material

Foreign material in safflower seed includes other grains, sclerotinia, soft earth pellets and stones.

Heated (HTD)

Heated seeds have the colour or odour typical of grain that has heated or deteriorated in storage. Heated kernels include kernels discoloured from artificial drying, but not charred kernels.

Representative portion for analysis

Minimum—100 g
Optimum—100 g
Export—100 g

Matter other than cereal grains (MOTCG)

Matter other than cereal grains refers to weed seeds and other grains that are not readily removable and may include

- Peas, lentils, beans, corn, other domestic or wild seeds
- Ergot and sclerotinia sclerotiorum

Representative portion for analysis

Minimum—100 g Optimum—250 g Export—250 g

Odour (ODOR)

There is no numeric tolerance for odour. Consider

- The basic quality of the sample
- The type and degree of the odour
- The presence of visible residue causing the odour

Representative portion for analysis

Minimum—working sample Optimum—working sample Export—working sample

If odour is the grade determinant and there is . . .	Then the grade is . . .
An excessive objectionable odour not associated with the quality of the grain, but not heated or fireburnt	*Safflower Seed, Sample Canada, Account Odour*
An excessive heated odour	*Safflower Seed, Sample Canada, Account Heated*
An excessive fireburnt odour	*Safflower Seed, Sample Canada, Account Fireburnt*

Other grains (OGRN)

Other grains in safflower seed include wheat,rye, triticale, barley, oats and groats, including wild oat groats, that remain in the cleaned sample.

Representative portion for analysis

Minimum—100 g Optimum—250 g Export—250 g

Rotted (ROT)

Seeds have the colour or odour typical of grain that has heated or deteriorated in storage. Rotted seed is considered in combination with heat-damaged kernels.

Representative portion for analysis

Minimum—100 g Optimum—100 g Export—100 g

Soft earth pellets (SEP)

Soft earth pellets are pellets that crumble under light pressure—if they do not crumble, they are considered stones. These pellets can be

- Earth and fertilizer pellets
- Any non-toxic material of similar consistency

Representative portion for analysis

Minimum—100 g Optimum—100 g Export—100 g

Soft earth pellets in safflower seed are considered as *Foreign material.*

Stones (STNS)

Stones are hard shale, coal, hard earth pellets, and any other non toxic materials of similar consistency. Fertilizer pellets are assessed as stones when constituting 1.0% or less of the net sample weight. (See *Fertilizer pellets* for specific procedures to be followed when samples contain fertilizer pellets.)

Representative portion for analysis

Minimum—250 g Optimum—500 g Export—1000 g

Procedures

1. Handpick stones from a representative portion of the cleaned sample.
2. Determine stone concentration in the net sample.

- In western Canada samples of grain containing stones in excess of "basic grade" tolerances, up to 2.5% are graded *Safflower Seed, Rejected "basic grade" Account Stones*. The "*basic grade*" refers to a grade established in the Canada Grain Regulations (grades listed in the first column in grade determinant tables) that would have been assigned to the sample if it contained no stones.
- In eastern Canada samples of grain containing stones in excess of grade tolerances are degraded to lower grades. Samples containing stones in excess of the tolerance of the lowest grade established by regulation up to 2.5% are graded *Safflower Seed, Sample Canada Account Stones.*
- In western and eastern Canada grain containing more than 2.5% stones is graded *Safflower Seed, Sample Salvage.*

Examples: Western Canada

Excerpt from grade determinant tables for
Safflower Seed, Canada

Grade name	**Stones**
No. 1 Canada	3K
No. 2 Canada	3K
No. 3 Canada	3K

K Number of kernel-sized pieces in 500 g

Basic grade:......................... *Safflower Seed, No. 2 Canada*
Reason for basic grade:....... 4.0% Dehulled

If the above sample contained	**Grade in western Canada**
6K stones	*Safflower Seed, Rejected No. 2 Canada Account Stones*
3.0% stones	*Safflower Seed, Sample Salvage*

Examples: Eastern Canada

Excerpt from grade determinant tables for
Safflower Seed, Canada

Grade name	**Stones**
No. 1 Canada	3K
No. 2 Canada	3K
No. 3 Canada	3K

K Number of kernel-sized pieces in 500 g

Basic grade:......................... *Safflower Seed, No. 2 Canada*
Reason for basic grade:....... 4.0% Dehulled

If the above sample contained	**Grade in eastern Canada**
6K stones	*Safflower Seed, Sample Canada Account Stones*
3.0% stones	*Safflower Seed, Sample Salvage*

Treated seed and other chemical substances

Treated seed

Treated seed is grain that has been coated with an agricultural chemical for agronomic purposes. These seed dressings contain a dye to render the treated seed visually conspicuous. The colour of the dye varies depending upon the type of treatment and the type of grain. The current Canadian colour standards for pesticide seed treatments are: cereals–pink or red, canola–baby blue or green. Seed treated with an inoculant may have a green stain. The coatings or stains may appear greasy or powdery and surface area distribution ranges from tiny flecks to complete coverage.

Other chemical substances

Other chemical substances refers to any chemical residues either adhering to the kernel or remaining in the sample and to samples having a chemical odour of any kind.

▲ **Important:** Wear gloves and a mask to handle any samples that you suspect may contain contaminated grain.

Representative portion for analysis

Minimum—working sample	Optimum—working sample	Export—working sample

If a sample is suspected of being coated with a pesticide, desiccant, inoculant or if the sample contains evidence of any foreign chemical substance other than fertilizer pellets, the sample shall be graded *Safflower Seed, Held IP Suspect Contaminated Grain.*

Note: Canadian Grain Commission personnel should refer to ISO national work instruction "*Suspect Contaminated Grain, Handling Procedures*" for specific procedures to be followed when handling samples suspected of containing treated seed or other chemical substances.

Varieties

Safflower seed is graded without reference to variety.

Primary and export grade determinants tables

Safflower Seed, Canada (CAN)

	Standard of quality	Damage		Foreign material			Hulls	
Grade name	**Degree of soundness**	**Heated %**	**Total %**	**Matter other than cereal grains %**	**Stones**	**Total %**	**Empty hulls %**	**Dehulled seeds %**
No. 1 Canada	Well matured, good natural colour	Nil	3	0.2	3K	0.5	0.5	2
No. 2 Canada	Reasonably well matured, may be moderately weather-stained	Nil	10	0.5	3K	2	1	5
No. 3 Canada	Excluded from higher grades on account of weather-stained, may have the odour associated with low-quality seed but not distinctly sour, musty or rancid	1	10	1	3K	5	2	8
Grade, if No. 3 specs not met		*Safflower Seed, Sample Canada Account Heated*	*Safflower Seed, Sample Canada Account Damaged*	*Safflower Seed, Sample Canada Account Admixture*	2.5% or less—*Safflower Seed, Rejected (grade) Account Stones* or *Safflower Seed, Sample Canada, Account Stones* Over 2.5%—*Safflower Seed, Sample Salvage*	*Safflower Seed, Sample Canada Account Admixture*	*Safflower Seed, Sample Canada Account Hulls*	*Safflower Seed, Sample Canada Account Dehulled*

K Number of kernel-sized pieces in 500 g

Export shipments

Export shipments can be commercially clean or not commercially clean.

Commercially clean

Shipments defined as commercially clean may contain up to 2.5% by weight of dockage.

Dockage is reported to the nearest

- 0.1% for samples representing commercially clean shipments loaded from a single terminal or transfer elevator
- 0.01% for composite samples representing shipments loaded from more than one terminal or transfer elevator

Not commercially clean (NCC)

Shipments that do not meet the standards for commercial cleanliness are referred to as not commercially clean. Such shipments are permitted only with the permission of the CGC.

For samples representing not commercially clean shipments approved by the CGC for shipment from terminal and transfer elevators, dockage is reported to the nearest

- 0.1% for samples representing commercially clean shipments loaded form a single terminal or transfer elevator
- 0.01% for composite samples representing shipments loaded from more than one terminal or transfer elevator

less a deduction of up to 0.2%.

Grading

Safflower seed on export is graded in accordance with primary grade standards and specifications.

16. Peas

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Determination of dockage

Definitions

Dockage is assessed and recorded to the nearest 0.1%.

Dockage is defined under the Canada Grain Act as "any material intermixed with a parcel of grain, other than kernels of grain of a standard of quality fixed by or under this Act for a grade of that grain, that must and can be separated from the parcel of grain before that grade can be assigned to the grain." Dockage is removed by following the cleaning procedures described in this section of the guide.

The sample as it arrives is referred to as the uncleaned or dirty sample. Its weight is the **gross weight** of the sample. Dockage is assessed on the gross weight of the sample.

Dockage not reported

▲ **Important:** Dockage is not reported for samples grading

- *Peas, Sample Canada* (colour or variety) *Account Fireburnt*
- *Peas Sample Salvage*
- *Peas, Sample Condemned*
- *Feed Peas, Canada*

Normal cleaning procedures

▲ **Important:** Wear gloves and a mask to handle any samples that you suspect may contain hazardous substances.

1. Using a Boerner-type divider, divide the uncleaned sample to obtain a representative portion.
    - Official samples should be at least 900 grams.
    - Unofficial samples must be at least 750 grams.
2. Sieve portions of approximately 250 grams at a time.
3. Sieve the sample over the slotted sieve that will achieve maximum removal of splits with minimum loss of whole peas. Use one of the following sieves:

    No. 8 slotted   No. 9 slotted   No. 11 slotted
4. Determine dockage, using the list under *Composition of dockage*.

Composition of dockage

- All coarse foreign vegetable matter such as pods, stems, straw, and thistle tops handpicked from the sieved sample
- Split peas removed through sieving—Split peas removed by sieves are handpicked from the dockage material and calculated as a percentage based on the gross weight of the sample. This portion is recorded as the percentage of splits in dockage
- Other material removed through sieving including pea hulls

Determination of foreign material in feed peas

Foreign material in feed peas is defined as any material other than whole peas, broken peas or pea seed coats.

Representative portion for analysis

Minimum—100g Optimum—250 g Export—250 g

Procedures

1. Using a Boerner-type divider, divide the gross sample to obtain a representative portion.
2. Handpick the representative portion to remove all foreign material.

   Note: Any approved sieve may be used to expedite the determination of foreign material, however only material other than peas, broken peas and pea seed coats is assessed as foreign material.

Optional analysis

Where a shipper requests special cleaning of a carlot of grain at a terminal or transfer elevator, and the elevator manager agrees, dockage material will be analyzed for the presence of grain. The percentage and grade of any grain contained in the dockage will be reported and elevator stocks will be adjusted on the basis of the analysis. Agreement of the shipper and unload elevator must be conveyed to the CGC in writing prior to the analysis being performed.

Procedures

1. Analyze the official sample.
2. Record the following on inspection records:
   - The percentage by gross weight to the nearest 0.1% and the grade of peas.
   - The percentage by gross weight to the nearest 0.1% and the grade of grain separable from dockage.
   - The percentage of dockage.

   Example
   95.0% Peas No. 1 CAN Yellow
   4.0% Peas Sample CAN Yellow Account Splits
   1.0% dockage

Sizing of yellow peas

In yellow peas only, size is part of the grade name.

1. Using a Boerner-type divider, divide a representative portion of 250 g.
2. Sieve the representative portion over the No. 14 round-hole sieve.
3. Determine the portion remaining on top of No. 14 round-hole sieve.

<table>
<tr><th>95% or more remains on top of No. 14 round-hole sieve</th><th colspan="3">Less than 95% remains on top of No. 14 round-hole sieve</th></tr>
<tr><td rowspan="7">The sample is designated *Large.*</td><td colspan="3">1. Recombine the sample.</td></tr>
<tr><td colspan="3">2. Sieve the sample over the No. 15 round-hole and No. 11 round-hole sieves.</td></tr>
<tr><td colspan="3">3. Determine the portion passing through the No. 15 round-hole sieve.</td></tr>
<tr><th colspan="2">90% or more passes through the No. 15 round-hole sieve</th><th>Less than 90% passes through</th></tr>
<tr><td colspan="2">Determine the amount that remains on top of the No. 11 round-hole sieve.</td><td rowspan="3">Graded without reference to size</td></tr>
<tr><th>95% or more</th><th>Less than 95%</th></tr>
<tr><td>The sample is designated *Small.*</td><td>Graded without reference to size</td></tr>
</table>

Grading

Important definitions

Net weight of sample

The sample after cleaning and removal of dockage is called the cleaned sample. Its weight is the net weight of the sample. Percentages by weight for grading of peas for human consumption refer to percentages of the cleaned sample, or the net weight.

Gross weight of sample

The sample as it arrives is referred to as the uncleaned sample. Its weight is the gross weight of the sample.

Note: Percentages by weight for grading feed peas refer to percentages of the uncleaned sample, or the gross weight.

Hazardous substances in samples

Wear gloves and a mask to handle any samples that you suspect may contain hazardous substances. Hazardous substances are defined in the Regulations as "any pesticide, herbicide or desiccant."

Representative portion sizes for grading

All grading of human consumption peas is done on representative portions divided down from the cleaned sample, using a Boerner-type divider.

All grading of feed peas is done on representative portions divided down from the gross sample, using a Boerner-type divider.

When the grading factor is . . .	Then use . . .
Normal	Optimum portion size
Severe	Minimum portion size or more **(do not use less)**

Values in the table represent a range of recommended portion sizes.

Representative portion of peas for grading, grams

Grading factor	Minimum	Optimum	Export
Binburnt	100	250	500
Bleached	50	100	100
Colour	working sample	working sample	working sample
Cracked seed coats	50	100	100
Damage	50	100	100
Ergot	250	500	1000
Excreta	working sample	working sample	working sample
Fireburnt	working sample	working sample	working sample
Foreign material	100	250	500
Heated	100	250	500
Inert material	working sample	working sample	working sample
Insect damage	50	100	100
Insect parts	working sample	working sample	working sample
Marsh spot	50	100	100
Odour	working sample	working sample	working sample
Other damage, marsh spot	50	100	100
Peas of other colours, classes	50	100	100
Pink Peas	50	100	100
Shrivelled	50	100	100
Splits	working sample	working sample	working sample

Grading factors

Binburnt

Binburnt refers to peas that are blackened as a result of severe heating in storage. There is a single tolerance in feed peas for the total of heated and binburnt.

Representative portion for analysis

Minimum—100 g Optimum—250 g Export—500 g

Bleached (BLCH)

Bleached applies to green peas only. Bleached is not a grading factor in Vienna peas.

Green peas are considered bleached if one-eighth or more of the surface of the cotyledon is bleached to a yellowish colour which is in marked contrast to its natural colour.

Representative portion for analysis

Minimum—50 g Optimum—100 g Export—100 g

Procedures

1. Examine a representative portion of the cleaned sample for any distinctly bleached or suspect bleached green peas.
2. Remove the seed coat from suspect seeds to determine the size of the bleached area on the cotyledons.

Classes

There are two classes of peas, green and other than green. The class forms part of the grade name. See *Peas of other colours.*

Colour (CLR)

Colour as a grade determinant is assessed after the removal of damaged peas and peas of other colours. Use standard colour charts or guides for picking out peas of other colours.

If peas are	**Colour is . . .**
A bright, normal colour, lightly earth tagged or lightly stained	Good
Moderately immature, moderately earth tagged or stained	Fair

If a sample of yellow peas contains . . .	**The sample is . . .**
Green peas	Considered damaged only if peas are damaged from another cause
Whole or split peas which are distinctly green throughout as a result of immaturity or variety	*Peas of other varieties*
Immature yellow peas	Considered damaged only if peas are damaged from another cause
Immature, but not distinctly green, peas	Not considered damaged, but taken into account in the general evaluation of the sample

Representative portion for analysis

Minimum—working sample	Optimum—working sample	Export—working sample

Contaminated grain

▲ **Important:** Wear gloves and a mask to handle any sample that is suspected of containing contaminated grain.

Contaminated is defined in the *"Canada Grain Act"* as; "Contaminated means, in respect of grain, containing any substance in sufficient quantity that the grain is unfit for consumption by persons or animals or is adulterated within the meaning of the regulations made pursuant to sections B.01.046(1), B.15.001 and B.15.002(1) of the *Food and Drugs Act*."

Samples deemed to be contaminated by the Grain Research Laboratory in consultation with the Chief Grain Inspector for Canada are graded *Peas, Sample Condemned.*

Cracked seed coats (CSDC)

Cracked seed coats includes

- Peas with cracked seed coats—if the peas are otherwise damaged, they are included in the tolerance for damage, not cracked seed coats
- Peas with all or part of the seed coat removed
- Broken peas with less than one-fourth of the pea broken off—broken peas with more than one-fourth of the pea broken off are considered damaged

Representative portion for analysis

Minimum—50 g
Optimum—100 g
Export—100 g

Damage (DMG)

Damaged peas include

- Split or broken peas where more than one-fourth of the pea is broken off
- Whole peas that are sprouted, heated, shrivelled, damaged by insects, badly deteriorated or discoloured by weather or by disease, or that are otherwise damaged in a way that seriously affects their appearance or quality

Representative portion for analysis

Minimum—50 g
Optimum—100 g
Export—100 g

Earth pellets

See *Foreign material.*

Ergot (ERG)

Ergot is a plant disease producing elongated fungus bodies that have a purplish-black exterior, a purplish-white to off-white interior, and a relatively smooth surface texture.

Representative portion for analysis

Minimum—250 g
Optimum—500 g
Export—1000 g

Excreta (EXCR)

▲ **Important:** Wear gloves and a mask to handle any samples that you suspect may contain excreta.

Representative portion for analysis

Minimum—working sample
Optimum—working sample
Export—working sample

Fertilizer pellets (FERT PLTS)

Fertilizer pellets are typically either small, round and white or irregular shaped and pink or red. Fertilizer pellets are not considered a hazardous substance however there is no visible means of assuring that material resembling fertilizer pellets is not some other contaminant.

Representative portion for analysis

Minimum—working sample	Optimum—working sample	Export—working sample

Procedures

- Handpick any fertilizer pellets and determine the concentration basis the net working sample.
- Fertilizer pellets are assessed as stones when the concentration does not exceed 1.0% of the net sample weight.
- Samples containing fertilizer pellets in excess of 1.0% of the net sample weight are graded *Peas, Held IP Suspect Contaminated Grain.*

Note: Canadian Grain Commission personnel should refer to ISO national work instruction "*Suspect Contaminated Grain, Handling Procedures*" for procedures to be followed when handling samples containing fertilizer pellets.

Fireburnt (FBNT)

Fireburnt kernels have been charred or scorched by fire. No fireburnt kernels are allowed in peas, split peas or feed peas.

Representative portion for analysis

Minimum—working sample	Optimum—working sample	Export—working sample

Foreign material (FM)

Foreign material is not a grading factor in feed peas. Foreign material is any material other than peas or split peas.

Representative portion for analysis

Minimum—100 g	Optimum—250 g	Export—500 g

Heated (HTD)

Peas or split peas that have dull seed coats and discoloured cotyledons ranging from light tan to dark brown are considered heated.

Representative portion for analysis

Minimum—100 g	Optimum—250 g	Export—500 g

Procedures

1. Pick out heated peas by hand.
2. Cut the kernels to expose the cotyledon.

If peas are . . .	Grading is . . .
Lightly damaged, with tan-coloured meats and distinct heated odour	Heated
Otherwise	Damaged

Inert material

Inert material refers to mineral matter such as stones, coal shale and hard and soft earth pellets.

Representative portion for analysis

Minimum—working sample	Optimum—working sample	Export—working sample

Insect damage (I DMG)

Insect damage in peas or split peas refers to damage caused by insects such as weevils.

Representative portion for analysis

Minimum—50 g	Optimum—100 g	Export—100 g

Insect parts (I PARTS)

Insect parts refers to pieces of insects such as grasshoppers and lady bugs that remain in the sample after cleaning or processing. Samples are analyzed for the percentage of insect fragments and graded according to established tolerances.

If pulse crops come into contact with insects during the harvesting process, it may result in seed staining and earth adhering to the seed and may result in samples having an objectionable odour. Samples containing staining of this nature will be considered to be earth tagged and graded according to colour definitions. Samples having a distinct objectionable odour not associated with the quality of the grain will be graded *Type of Grain* Sample Account Odour.

Representative portion for analysis

Minimum—working sample	Optimum—working sample	Export—working sample

Marsh spot

This nutritional disorder, caused by manganese deficiency in the soil, results in dark reddish brown spots or cavities on the inner surface of the cotyledons. Marsh spot is considered *Other damage* in peas.

Representative portion for analysis

Minimum—50 g
Optimum—100 g
Export—100 g

Procedure

Pearl the representative portion to split and expose the inner surface of the cotyledon.

Odour (ODOR)

There is no numeric tolerance for odour. Consider

- The basic quality of the sample
- The type and degree of the odour
- The presence of visible residue causing the odour

Representative portion for analysis

Minimum—working sample
Optimum—working sample
Export—working sample

If odour is the grade determinant and there is....	**Then the grade is....**
An excessive objectionable odour not associated with the quality of the grain, but not heated or fireburnt	*Peas, Sample Canada (colour and size) Account Odour*
An excessive heated odour	*Peas, Sample Canada (colour and size) Account Heated*
An excessive fireburnt odour	*Peas, Sample Canada (colour and size) Account Fireburnt*

Other damage (ODMG)

Other damage is

- Any damage other than splits, insect damage, heated or shrivelled
- Any discolouration or physical damage on the face of the cotyledon

Representative portion for analysis

Minimum—50 g
Optimum—100 g
Export—100 g

Pink peas

Pink peas refers to staining caused by the bacteria Erwinia Rhapontic

Food peas

- Surface discolouration is to be considered in the overall colour assessment of the sample
- Discolouration that extends into the cotyledon is to be considered damaged

Feed peas

- Colour is not a factor

Care must be taken in assessing these pink peas as there are pink seed treatments for peas being used. Questionable samples are to be handled as per the ISO national procedure for handling suspect contaminated seeds.

Representative portion for analysis

Minimum—50 g	Optimum—100 g	Export—100 g

Peas of other colours (POOCLR)

Colour is determined by the cotyledon colour and, in the case of Maple peas, seed coat colour. *Peas of other colours* includes any whole and split peas that are obviously of another colour or class.

Representative portion for analysis

Minimum—50 g	Optimum—100 g	Export—100 g

Pulses other than green or yellow peas

In feed peas, pulses other than green or yellow peas refers specifically to maple and marrowfat peas. These are not considered as part of foreign material. Other pulses such as beans, chick peas and lentils are included in foreign material.

Sclerotinia sclerotiorum (SCL)

Sclerotinia sclerotiorum is a fungus producing hard masses of fungal tissue, called *sclerotia*. The sclerotia vary in size and shape, have a course surface texture, vary in exterior color from dark black to gray to white and have a pure white interior. See *Foreign material.*

Shrivelled (SHV)

Shrivelled peas are distinctly distorted and shrunken, or have a severely dimpled surface.

Representative portion for analysis

Minimum—50 g	Optimum—100 g	Export—100 g

Splits (SPLTS)

Splits include split peas, pea hulls, split peas of other colours, broken pieces that are less than three-quarters of the whole seed, and cotyledons that are loosely held together by the seed coat.

Representative portion for analysis

Minimum	Optimum	Export
working sample	working sample	working sample

Treated seed and other chemical substances

Treated seed

Treated seed is grain that has been coated with an agricultural chemical for agronomic purposes. These seed dressings contain a dye to render the treated seed visually conspicuous. The colour of the dye varies depending upon the type of treatment and the type of grain. The current Canadian colour standards for pesticide seed treatments are: cereals–pink or red, canola–baby blue or green. Seed treated with an inoculant may have a green stain. The coatings or stains may appear greasy or powdery and surface area distribution ranges from tiny flecks to complete coverage.

Other chemical substances

Other chemical substances refers to any chemical residues either adhering to the kernel or remaining in the sample and to samples having a chemical odour of any kind.

▲ **Important:** Wear gloves and a mask to handle any samples that you suspect may contain contaminated grain.

Representative portion for analysis

Minimum	Optimum	Export
working sample	working sample	working sample

If a sample is suspected of being coated with a pesticide, desiccant, inoculant or if the sample contains evidence of any foreign chemical substance other than fertilizer pellets, the sample shall be graded *Peas, Held IP Suspect Contaminated Grain.*

Note: Canadian Grain Commission personnel should refer to ISO national work instruction "*Suspect Contaminated Grain, Handling Procedures*" for specific procedures to be followed when handling samples suspected of containing treated seed or other chemical substances.

Variety

On written request, the variety is shown as part of the grade name, for example, *Peas, No. 2 Canada, Maple.* "Varietal purity not guaranteed" is shown in the Remarks section of certificate issued using a varietal name.

Primary and export grade determinants tables

Peas, Canada Green (CAN)

Grade name	Standard of quality	Other classes and bleached			Foreign material			
	Colour	Other classes %	Bleached %	Total %	Ergot %	Excreta %	Insect parts %	Total %
No. 1 Canada	Good natural colour	0.5	2.0	2.0	0.05	0.01	0.02	0.1
No. 2 Canada	Fair colour	1.0	3	**3.8**	0.05	0.01	0.02	0.2
No. 3 Canada	Off-colour	2	5	**6.5**	0.05	0.01	0.02	0.5
Grade, if No. 3 specs not met		10.0% or less— *Peas, Sample Canada (Green or variety) Account Mixed Colours* Over 10.0%— *Peas, Sample Canada Account Mixed Colours*	*Peas, Sample Canada (Green or variety) Account Bleached*	*Peas, Sample Canada (Green or variety) Account Mixed Colours and Bleached*	*Peas, Sample Canada (Green or variety) Account Ergot*	*Peas, Sample Canada (Green or variety), Account Excreta*	*Peas, Sample Canada (Green or variety) Account Admixture*	*Peas, Sample Canada (Green or variety) Account Admixture*

Grade name	Cracked seed coats including splits %	Damage					
		Heated %	Insect damage %	Other damage %	Shrivelled %	Splits %	Total %
No. 1 Canada	5	Nil	0.3	2	2	0.5	3
No. 2 Canada	8	0.1	0.8	4	4	1	5
No. 3 Canada	13	0.5	**2.5**	10	8	5	12
Grade, if No. 3 specs not met	*Peas, Sample Canada (Green or variety) Account Cracked Seed Coats*	*Peas, Sample Canada (Green or variety) Account Heated*	*Peas, Sample Canada (Green or variety) Account Insect Damage*	*Peas, Sample Canada (Green or variety) Account Damage*	*Peas, Sample Canada (Green or variety) Account Shrivelled*	*Peas, Sample Canada (Green or variety) Account Splits*	*Peas, Sample Canada (Green or variety) Account Damage*

Note: The variety or colour is added to the grade name.

Peas, Canada, other than Green (CAN)

	Standard of quality		Foreign material			
Grade name	**Colour**	**Other colours %**	**Ergot %**	**Excreta %**	**Insect parts %**	**Total %**
No. 1 Canada	Good natural colour	1.0	0.05	0.01	0.02	Trace
No. 2 Canada	Fair colour	2.0	0.05	0.01	0.02	0.5
Extra No. 3 Canada	Fair colour	2.0	0.05	0.01	0.02	0.5
No. 3 Canada	Off-colour	3	0.05	0.01	0.02	1
Grade, if No. 3 specs not met		*Peas, Sample Canada (Yellow* or *variety) Account Mixed Colours*	*Peas, Sample Canada (Yellow* or *variety) Account Ergot*	*Peas, Sample Canada (Yellow or variety), Account Excreta*	*Peas, Sample Canada (Yellow or variety), Account Admixture*	*Peas, Sample Canada (Yellow or variety) Account Admixture*

		Damage					
Grade name	**Cracked seed coats including splits %**	**Heated %**	**Insect damage %**	**Other damage %**	**Shrivelled %**	**Splits %**	**Total %**
No. 1 Canada	5	Nil	1.0	3	3	1	3
No. 2 Canada	9.5	0.05	1.5	5	5	2.5	5
Extra No. 3 Canada	13	0.05	1.5	5	5	5	8.5
No. 3 Canada	15	0.2	4	10	7	5	10
Grade, if No. 3 specs not met	*Peas, Sample Canada (Yellow or variety) Account Cracked Seed Coats*	*Peas, Sample Canada (Yellow or variety) Account Heated*	*Peas, Sample Canada (Yellow or variety) Account Insect Damage*	*Peas, Sample Canada (Yellow or variety) Account Damage*	*Peas, Sample Canada (Yellow or variety) Account Shrivelled*	*Peas, Sample Canada (Yellow or variety) Account Splits* Over 5% and over 3% other colours—*Peas, Sample Canada, Account Mixed Colours and Splits*	*Peas, Sample Canada (Yellow or variety) Account Damage*

Note: The variety or colour is added to the grade name.

Peas, Canada Feed (CAN)

Grade name	Fireburnt %	Heated and binburnt %	Pulses other than green and yellow peas %	Inert material %	Ergot %	Excreta %
Canada Feed Peas	Nil	1	5	1	0.05	0.02
Grade, if Feed peas specs not met	*Feed Peas, Sample Canada Account Fireburnt Kernels*	*Feed Peas, Sample Canada Account Heated*	*Feed Peas, Sample Canada Account Pulses Other than Green and Yellow Peas*	*Feed Peas, Sample Canada Account Inert Material*	*Feed Peas, Sample Canada Account Ergot*	*Feed Peas, Sample Canada Account Excreta*

Export shipments

Peas, on export, are graded in accordance with primary grade standards and specifications. Foreign material in cleaned or processed peas is treated as a grading factor and not assessed as dockage. Cargoes containing dockage may not be shipped except with permission from the CGC.

Processed vs Not Processed

Samples are considered to be processed or commercially clean when:

- Containing 0.2% or less of small weed seeds and coarse vegetable matter and,
- Pea hulls constitute 10% or less by weight of the split peas in the sample.

To determine if the sample is processed, the following steps are to be completed:

1. Using a Boerner-type divider, divide the sample to obtain a representative portion of at least 900 grams
2. Select the slotted sieve (#8, #9 or #11) that will achieve maximum removal of splits with a minimum loss of whole peas. Nest the selected slotted sieve over a No. 4.5 round hole sieve. Sieve the sample, approximately 250 grams at a time, over the nested sieves.
3. Small weed seeds passing through the No. 4.5 round hole are weighed and the percentage calculated
4. The portion remaining on top of the slotted sieve is handpicked to remove coarse vegetable matter and its percentage calculated
5. The percentages of small weed seeds and coarse vegetable matter are added together to determine if the total meets the processed specification
6. Splits and pea hulls are separated from the entire sample. Determine if the pea hulls constitute 10% or less by weight of the split peas

If any of the components exceed the allowable limits as defined above, the shipment become *not commercially clean or not processed* and dockage is assessed using procedures for primary samples. Dockage is reported to the nearest

- 0.1% for samples representing commercially clean shipments loaded from a single terminal or transfer elevator
- 0.01% for composite samples representing shipments loaded form more than one terminal or transfer elevator

less a deduction of up to 0.2% to take into account the buildup of attritional material.

The terms processed and unprocessed do not apply to Feed peas.

17. Corn

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Determination of dockage

Definitions

Dockage is only assessed when producers deliver corn to country elevators in eastern Canada. Dockage is assessed to the nearest 0.1%. In all other locations, this material is called *Cracked corn and foreign material* (CCFM) and is a grading factor.

Dockage is defined under the Canada Grain Act as "any material intermixed with a parcel of grain, other than kernels of grain of a standard of quality fixed by or under this Act for a grade of that grain, that must and can be separated from the parcel of grain before that grade can be assigned to the grain." Dockage is removed by following the cleaning procedures described in this section of the manual.

The sample as it arrives is referred to as the uncleaned or dirty sample. Its weight is the **gross weight** of the sample. Dockage is assessed on the gross weight of the sample.

Dockage not reported

▲ **Important:** Dockage is not reported when corn is graded

- *Corn, Sample CE Account Fireburnt*
- *Corn, Sample Salvage*
- *Corn, Sample Condemned*

Normal cleaning procedures: Carter dockage tester

▲ **Important:** Wear gloves and a mask to handle any sample which you suspect may contain hazardous substances.

Assess dockage before assessing test weight.

1. Set up the Carter dockage tester as follows:

Feed control	# 10
Air control	off
Riddle	none
Top sieve	No. 12 round-hole (moisture 25.0% or less) No. 14 round-hole (moisture over 25.0%)
Centre sieve	blank tray
Bottom sieve	none
Sieve cleaner	off

2. Using a Boerner-type divider, divide the uncleaned sample to obtain a representative portion.
   - Official samples should be at least 900 g.
   - Unofficial samples should be at least 750 g.
3. Turn on the Carter dockage tester.

4. Pour the sample into the hopper.
5. After the sample has passed through the machine, turn off the Carter dockage tester.
6. Remove the sample pans containing the corn and broken corn.
7. Determine dockage, using the list under *Composition of dockage*.

Normal cleaning procedures: manual procedures

Manual procedures for normal cleaning of corn require

- No. 12 round-hole sieve for corn with 25% moisture or less
- No. 14 round-hole sieve for corner over 25% moisture

1. Using a Boerner-type divider, divide the uncleaned sample to obtain a representative portion.
   - Official samples should be at least 900 g.
   - Unofficial samples should be at least 750 g.
2. Sieve approximately 250 g at a time on the appropriate hand sieve until all possible material has fallen through the sieve.
3. Handpick material remaining on top of the sieve as described under *Composition of dockage*.

Composition of dockage

- All material which passes through the No. 12 or No. 14 round-hole sieve
- All foreign material and pieces of cob handpicked from the sample, excluding stones

Estimating test weight of well-matured corn after drying

Note: Test weight is determined on corn prior to removal of cracked corn and foreign material. At country elevators in eastern Canada test weight is determined after the removal of dockage.

Corn samples that contain a high percentage of moisture typically show an increase in test weight after drying. Use the following table to predict the test weight of well-matured corn before drying.

▲ **Important:** This is only a guide, and works only with well matured corn. Samples should be checked yearly to ensure that the forumla applies for that crop condition.

	Amount to add	
Moisture range	**kg/hL**	**g/0.5 L**
15.8 - 16.4	0.5	2.6
16.5 - 16.9	1.0	5.2
17.0 - 17.3	2.0	10.5
17.4 - 17.6	2.1	11.0
17.7 - 17.9	2.2	11.5
18.0 - 18.3	2.3	12.0
18.4 - 18.6	2.4	12.5
18.7 - 18.9	2.5	13.0

1. Find the moisture range for the test weight of the sample.
2. Add the amount for that moisture range in the appropriate units, either kg/hl or g/l.

▲ **Important**: Corn samples are not to be downgraded on the basis of an "estimated" test weight. Questionable samples must be dried by exposure and then have the test weight determined.

For example,
The moisture for the tested sample is 17.5%, and the test weight is in kg/hl.

	Amount to add	
Moisture range	**kg/hL**	**g/0.5 L**
17.4 - 17.6	2.1	11.0

Add 2.1 to the test weight in kg/hl.

Grading

Important definitions

Net weight of sample

The sample after cleaning and removal of dockage is referred to as the cleaned sample. Its weight is the net weight of the sample. Percentages by weight for grading refer to percentages of the net weight.

Kernel counts (K)

A kernel count is the number of kernel-sized pieces of stones in a sample of corn.

- To do kernel counts, you must have 500 grams of cleaned sample.
- All grading is done on representative portions divided down from the cleaned sample using a Boerner-type divider.

Hazardous substances in samples

Wear gloves and a mask to handle any samples that you suspect may contain hazardous substances. Hazardous substances are defined in the Regulations as "any pesticide, herbicide or desiccant."

Representative portions for grading

All grading is done on representative portions divided down from the cleaned sample, using a Boerner-type divider.

When the grading factor is . . .	Then use . . .
Normal	Optimum portion size
Severe	Minimum portion size or more **(do not use less)**

Values in this table represent a range of recommended portion sizes.

Representative portion of corn for grading, grams

Grading factor	Minimum	Optimum	Export
Caramelized kernels	100	**500**	500
Classes	100	**working sample**	working sample
Cracked corn and foreign material	working sample	**working sample**	working sample
Damage	100	**500**	500
Excreta	working sample	**working sample**	working sample
Fireburnt	working sample	**working sample**	working sample
Heated and rotted	100	**500**	working sample
Odour	working sample	**working sample**	working sample
Stones	500	**working sample**	working sample

Grading factors

Blue-eye mould

Germs of kernels appear dark blue with mould, or there may be just a visible mouldy blue streak under the hull of the germ. In the second case, peel back the hull from the germ to examine the germ.

Blue-eye mould is included in the tolerance for *Damage*.

Representative portion for analysis

Minimum—100 g	Optimum—500 g	Export—500 g

Caramelized kernels

Caramelized kernels are kernels that were very immature when dried at a high temperature in a dryer, and the heat has turned the kernel to a scorched colour similar to that of heated kernels. The outer hull of the kernel may be peeled off showing a slightly damaged kernel inside. These kernels are classed as *Damaged.*

Representative portion for analysis

Minimum—100 g	Optimum—500 g	Export—500 g

Classes

Corn is classed as yellow, white, or mixed. The class forms part of the grade name; for example, *Corn, Sample CW Yellow Account Heated.*

Samples of yellow and white corn containing less than 95.0% of one class are designated *Mixed*; for example, *Corn No. 1 CE Mixed.*

Representative portion for analysis

Minimum—100 g	Optimum—working sample	Export—working sample

Contaminated grain

▲ **Important:** Wear gloves and a mask to handle any sample that is suspected of containing contaminated grain.

Contaminated is defined in the *"Canada Grain Act"* as; "Contaminated means, in respect of grain, containing any substance in sufficient quantity that the grain is unfit for consumption by persons or animals or is adulterated within the meaning of the regulations made pursuant to sections B.01.046(1), B.15.001 and B.15.002(1) of the *Food and Drugs Act*."

Samples deemed to be contaminated by the Grain Research Laboratory in consultation with the Chief Grain Inspector for Canada are graded *Corn, Sample Condemned.*

Cracked corn and foreign material (CCFM)

Cracked corn and foreign material includes any of the following:

- All material including kernels and pieces of kernels of corn or any other grains which pass through a No. 12 round-hole sieve or, for samples with a moisture level over 25.0%, through the No. 14 round-hole sieve
- All foreign material other than stones handpicked from the sample, including pieces of cobs that were not removed by sieving

Representative portion for analysis

Minimum—working sample	Optimum—working sample	Export—working sample

Procedures

▲ **Important:** Follow procedures for assessing dockage.

Damage (DMG)

Damaged kernels include whole kernels or pieces of kernels which are

- Affected by blue-eye mould and other types of moulds
- Sprouted
- Ground-damaged
- Weathered
- Diseased
- Frosted
- Scorched, from a drier
- Heated, naturally, or from a drier, or caramelized
- Rotted

Representative portion for analysis

Minimum—100 g	Optimum—500 g	Export—500 g

Earth pellets

- Hard earth pellets are pellets that do not crumble under light pressure. See *Stones.*
- Soft earth pellets are pellets that crumble under light pressure. See *Cracked corn and foreign material.*

Excreta (EXCR)

▲ **Important:** Wear gloves and a mask to handle any samples that you suspect may contain excreta.

Representative portion for analysis

Minimum—working sample	Optimum—working sample	Export—working sample

Procedures

Samples of corn containing excreta are graded on a comparable basis using tolerances established for excreta in other grains.

Fertilizer pellets (FERT PLTS)

Fertilizer pellets are typically either small, round and white or irregular shaped and pink or red. Fertilizer pellets are not considered a hazardous substance however there is no visible means of assuring that material resembling fertilizer pellets is not some other contaminant.

Representative portion for analysis

Minimum—working sample
Optimum—working sample
Export—working sample

Procedures

- Handpick any fertilizer pellets and determine the concentration basis the net working sample.
- Fertilizer pellets are assessed as stones when the concentration does not exceed 1.0% of the net sample weight.
- Samples containing fertilizer pellets in excess of 1.0% of the net sample weight are graded *Corn, Held IP Suspect Contaminated Grain.*

Note: Canadian Grain Commission personnel should refer to ISO national work instruction "*Suspect Contaminated Grain, Handling Procedures*" for procedures to be followed when handling samples containing fertilizer pellets.

Fireburnt (FBNT)

Fireburnt kernels are kernels charred or scorched by fire. A cross-section of a fireburnt kernel resembles charcoal with numerous air holes. The air holes result in a low weight kernel which crumbles easily under pressure.

Representative portion for analysis

Minimum—working sample
Optimum—working sample
Export—working sample

Procedures

Samples of corn containing fireburnt kernels are graded *Corn, Sample CW/CE (class) Account /Fireburnt.*

Foreign material (FM)

See *Cracked corn and foreign material (CCFM).*

Heated (HTD)

Heated kernels have at least one of the following characteristics:

- Whole kernels or pieces of kernels which range in colour from amber to dark brown over the entire kernel
- Kernels which are totally discoloured by fermentation and show no natural colour on the crowns or dorsals, or both
- The germ of the kernel is amber to dark brown and is severely puffed in the germ area when heated in a drier
- A kernel of any other grain that is heated

If kernels exhibit none of the above characteristics, but are not whole or sound, they are classed as *Damaged.*

Note: Cracked corn and foreign material that is heated is included with heated corn for grade assessment.

Representative portion for analysis

Minimum—100 g	Optimum—500 g	Export—500 g

Odour (ODOR)

There is no numeric tolerance for odour. Consider

- The basic quality of the sample
- The type and degree of the odour
- The presence of visible residue causing the odour

Grains grading No. 1 through 4 must be cool and sweet. Corn grading No. 5 may have a slight odour associated with the low quality, but the odour cannot be sour or musty.

Representative portion for analysis

Minimum—working sample	Optimum—working sample	Export—working sample

If odour is the grade determinant and there is . . .	Then the grade is . . .
An excessive objectionable odour not associated with the quality of the grain, but not heated or fireburnt	*Corn, Sample CW/CE Account Odour*
An excessive heated odour	*Corn, Sample CW/CE Account Heated*
An excessive fireburnt odour	*Corn, Sample CW/CE Account Fireburnt*

Rotted (ROT)

Rotted kernels are whole kernels or pieces of kernels which are visibly in advanced stages of decomposition and feel spongy under pressure. Rotted kernels are included in the percentage of heated kernels for grade assessment.

Representative portion for analysis

Minimum—100 g	Optimum—500 g	Export—500 g

Stones (STNS)

Stones are hard shale, coal, hard earth pellets, and any other non toxic materials of similar consistency. Fertilizer pellets are assessed as stones when constituting 1.0% or less of the net sample weight. (See *Fertilizer pellets* for specific procedures to be followed when samples contain fertilizer pellets.)

Representative portion for analysis

Minimum—500 g	Optimum—1000 g	Export—1000 g

Procedures

1. Handpick stones from a representative portion of the cleaned sample.
2. Determine stone concentration in the net sample.

- In western Canada samples of grain containing stones in excess of "basic grade" tolerances, up to 2.5% are graded *Corn, Rejected "basic grade" Account Stones*. The "*basic grade*" refers to a grade established in the Canada Grain Regulations (grades listed in the first column in grade determinant tables) that would have been assigned to the sample if it contained no stones.
- In eastern Canada samples of grain containing stones in excess of grade tolerances are degraded to lower grades. Samples containing stones in excess of the tolerance of the lowest grade established by regulation up to 2.5% are graded *Corn, Sample Canada Account Stones.*
- In western and eastern Canada grain containing more than 2.5% stones is graded *Corn, Sample Salvage.*

Examples: Western Canada

Excerpt from grade determinant tables for
Corn, Canada Western, White, Yellow or Mixed

Grade name	Stones
No. 1 CW	3K
No. 2 CW	3K
No. 3 CW	3K
No. 4 CW	3K
No. 5 CW	3K

K Number of kernel-sized pieces in 500 g

Basic grade:......................... *Corn, No. 2 CW Yellow*
Reason for basic grade:....... 3.0% Cracked corn and foreign material

If the above sample contained	Grade in Western Canada
10K stones	*Corn, Rejected No. 2 CW Yellow Account Stones*
3.0% stones	*Corn, Sample Salvage*

Examples: Eastern Canada

Excerpt from grade determinants table for
Corn, Canada Eastern, White, Yellow or Mixed

Grade name	Stones
No. 1 CE	3K
No. 2 CE	3K
No. 3 CE	3K
No. 4 CE	3K
No. 5 CE	3K

K Number of kernel-sized pieces in 500 g

Basic grade:......................... *Corn, No. 2 CE Yellow*
Reason for basic grade:....... 3.0% Cracked corn and foreign material

If the above sample contained	Grade in Eastern Canada
10K stones	*Corn, Sample CE Yellow Account Stones*
3.0% stones	*Corn, Sample Salvage*

Treated seed and other chemical substances

Treated seed

Treated seed is grain that has been coated with an agricultural chemical for agronomic purposes. These seed dressings contain a dye to render the treated seed visually conspicuous. The colour of the dye varies depending upon the type of treatment and the type of grain. The current Canadian colour standards for pesticide seed treatments are: cereals–pink or red, canola–baby blue or green. Seed treated with an inoculant may have a green stain. The coatings or stains may appear greasy or powdery and surface area distribution ranges from tiny flecks to complete coverage.

Other chemical substances

Other chemical substances refers to any chemical residues either adhering to the kernel or remaining in the sample and to samples having a chemical odour of any kind.

▲ **Important:** Wear gloves and a mask to handle any samples that you suspect may contain contaminated grain.

Representative portion for analysis

Minimum—working sample	Optimum—working sample	Export—working sample

If a sample is suspected of being coated with a pesticide, desiccant, inoculant or if the sample contains evidence of any foreign chemical substance other than fertilizer pellets, the sample shall be graded *Corn, Held IP Suspect Contaminated Grain*.

Note: Canadian Grain Commission personnel should refer to ISO national work instruction "*Suspect Contaminated Grain, Handling Procedures*" for specific procedures to be followed when handling samples suspected of containing treated seed or other chemical substances.

Varieties

Corn is graded without reference to variety.

Primary and export grade determinants table

Corn, Canada Western/Canada Eastern Yellow, White or Mixed (CW/CE)

	Standard of quality		Damage				
Grade name	Minimum test weight kg/hL (g/0.5 L)	Degree of soundness	Heated %	Total %	Stones	Cracked corn and foreign material %	Other classes %
No. 1 CW/CE	68 (344)	Cool and sweet, uniform size	0.1	3	3K	2	5
No. 2 CW/CE	66 (333)	Cool and sweet	0.2	5	3K	3	5
No. 3 CW/CE	64 (322)	Cool and sweet	0.5	7	3K	5	5
No. 4 CW/CE	62 (311)	Cool and sweet	1	10	3K	7	5
No. 5 CW/CE	58 (290)	May have a slight odour, not sour or musty	3	15	3K	12	5
Grade, if No. 5 specs not met	*Corn, Sample CW/CE (class) Account Light Weight*		*Corn, Sample CW/CE (class) Account Heated*	*Corn, Sample CW/CE (class) Account Damaged*	2.5% or less—*Corn, Rejected (grade) (class) Account Stones* or *Corn, Sample CE (class) Account Stones* Over 2.5%—*Corn, Sample Salvage*	50% or less—*Corn Sample CW/CE (class) Account CCFM* Over 50%—*Sample Cracked Corn and Foreign Material*	Over 5%—Use all other grading criteria and grade as *Corn (grade) Mixed*

K Number of kernel-sized pieces in 500 g

Note: The colour is added to the grade name.

Export shipments

Grading

Corn on export is graded in accordance with primary grade standards and specifications.

Cracked corn and foreign material (CCFM)

Because breakage occurs during handling at terminal and transfer elevators, round down percentages by weight of CCFM to the nearest whole number only on officially sampled and inspected shipments from a transfer or terminal elevator.

For example, a sample containing 4.7% CCFM by weight is recorded as containing 4.0% CCFM for grading purposes only on officially sampled and inspected shipments from a transfer or terminal elevator.

18. Lentils

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Determination of dockage

Definitions

Dockage is assessed and recorded to the nearest 0.1%.

Dockage is defined under the Canada Grain Act as "any material intermixed with a parcel of grain, other than kernels of grain of a standard of quality fixed by or under this Act for a grade of that grain, that must and can be separated from the parcel of grain before that grade can be assigned to the grain." Dockage is removed by following the cleaning procedures described in this section of the guide.

The sample as it arrives is referred to as the uncleaned or dirty sample. Its weight is the **gross weight** of the sample. Dockage is assessed on the gross weight of the sample.

Dockage is assessed in three stages.

1. Follow *Determination of cleaning procedures* using the No.14 round-hole hand sieve.
2. Follow *Normal cleaning procedures*, using the Carter dockage tester.
3. Follow procedures for *Cleaning for grade improvement*.

Determination of cleaning procedures

▲ **Important:** Wear gloves and a mask to handle any samples that you suspect may contain hazardous substances.

1. Using a Boener-type divider, divide from the uncleaned sample, a representative portion of approximately 250 g.
2. Sieve the representative portion over the No.14 round-hole hand sieve.

   When using hand sieves, move the sieve from left to right 20 times, using a sifting motion. One time is one complete motion from the centre to one side, to the other side, and back to the centre. The total distance from left to right is 20 cm, or about eight inches.
3. Determine the portion remaining on top of the No.14 round-hole sieve.

   Note: When results may be affected by excessive dockage material, reduce the material through sieving or handpicking without removing whole lentils.

If ...	The sample will be cleaned as ...
10% or more remains on top of the No. 14 round-hole sieve	*Large*
Less than 10% remains on top of the No. 14 round-hole sieve	*Small*

Dockage not reported

▲ **Important:** Dockage is not reported for samples grading

- *Lentils, Sample Canada Account Fireburnt*
- *Lentils, Sample Salvage*
- Lentils, Sample Condemned

Normal cleaning procedures

1. Set up the Carter dockage tester as follows:

   Note: Select the riddle that will achieve the maximum removal of large dockage material with the minimum removal or lodging of lentils.

Setting	Small	Large
Feed control	#5	#6
Air control	#7	#7
Riddle	No.1 or No.25	No.25 or No.6
Top sieve	No. 9 round-hole	No. 12 round-hole
Centre sieve	blank tray	blank tray
Bottom sieve	none	none
Sieve cleaner control	Off	Off

2. Using a Boerner-type divider, divide the uncleaned sample to obtain a representative portion.
   - Official samples should be at least 900 grams.
   - Unofficial samples should be at least 750 grams.
3. Turn on the Carter dockage tester.
4. Pour the sample into the hopper.
5. Turn off the dockage tester after sample passes through.
6. Lightly snap the retainer rod of the aspiration pan to loosen material gathered on the air screen.
7. Remove the aspiration pan.
8. Determine dockage using the list under *Composition of dockage.*

Composition of dockage

- Material other than whole lentils that remain on top of the riddle—whole sound lentils are returned to the sample
- Material which passes through the selected round-hole sieve
- Material removed by aspiration
- Material removed by special cleaning for grade improvement procedures if the grade can be improved

Cleaning for grade improvement

If the grade of a sample can be improved by additional cleaning to remove foreign material, perform the cleaning and add the additional material to dockage. Cleaning for grade improvement can be done at any time after normal cleaning.

1. Sieve the sample by hand using the appropriate hand sieve.

   ▲ **Important:** When you use a hand sieve, move the sieve from left to right 30 times, using a sifting motion. One time is one complete motion from the centre, to one side, to the other side, and back to the centre. The total distance from left to right is 20 cm.

2. Weigh the additional dockage and add it to the original dockage.

Size of lentil	Equipment	Effect on composition of dockage
Small	No. 9x9 wire hand sieve No. 10 round-hole hand sieve	Material removed by the sieve is added to dockage. Not more than 5% of whole sound lentils may be removed for each single grade improvement.
Large	No. 9x9 wire hand sieve	Material removed by the sieve is added to dockage. Not more than 5% of whole sound lentils may be removed for each single grade improvement.

Determination of size (sizing)

On written request, processed lentils are designated as large or small.

▲ **Important:** Wear gloves and a mask to handle any samples that you suspect may contain hazardous substances.

1. Set up the Carter dockage tester as follows:

Feed control	#6
Air control	Off
Riddle	None
Top sieve	No. 15 round-hole
Centre sieve	No. 12 round-hole
Bottom sieve	Blank tray
Sieve cleaner control	Off

2. Using a Boerner-type divider, divide the cleaned sample to obtain a representative portion of 250 g.
3. Turn on the Carter dockage tester.
4. Pour the sample into the hopper.
5. After the sample has passed through the machine, turn off the dockage tester.
6. Weigh separately. The percentage by weight determines the size of the lentils in the sample.

If . . .	**Then the size is . . .**
97% or more of the sample remains on top of a No. 15 round-hole sieve	*Large, for example, Lentils, No. 1 CAN*
80% or more passes through the No. 12 round-hole sieve	*Small, for example, Lentils, No. 1 CAN*
otherwise	no size indicated

Optional analysis

Where a shipper requests special cleaning of a carlot of grain at a terminal or transfer elevator, and the elevator manager agrees, dockage material will be analyzed for the presence of grain. The percentage and grade of any grain contained in the dockage will be reported and elevator stocks will be adjusted on the basis of the analysis. Agreement of the shipper and unload elevator must be conveyed to the CGC in writing prior to the analysis being performed.

Procedures

1. Analyze the official sample.
2. Record the following on inspection records:
    - The percentage by gross weight to the nearest 0.1% and the grade of lentils.
    - The percentage by gross weight to the nearest 0.1% and the grade of grain separable from dockage.
    - The percentage of dockage.

    Example
    95.0% Lentils, No. 1 CAN
    4.0% Domestic Mustard Seed, No. 1 CAN Oriental
    1.0% dockage

Grading

Important definitions

Net weight of sample

The sample after cleaning and removal of dockage is referred to as the cleaned sample. Its weight is the net weight of the sample. Percentages by weight for grading refer to percentages of the cleaned sample, or the net weight.

Hazardous substances in samples

Wear gloves and a mask to handle any samples that you suspect may contain hazardous substances. Hazardous substances are defined in the Regulations as "any pesticide, herbicide or desiccant."

Representative portions for grading

All grading is done on representative portions divided down from the cleaned sample, using a Boerner-type divider.

When the grading factor is . . .	Then use . . .
Normal	Optimum portion size
Severe	Minimum portion size or more **(do not use less)**

Values in this table represent a range of recommended portion sizes.

Representative portion of lentils for grading, grams

Grading factor	Minimum	Optimum	Export
Ascochyta	25	**100**	100
Contrasting colours	50	**100**	250
Damage	25	**50**	100
Ergot	500	**working sample**	working sample
Excreta	working sample	**working sample**	working sample
Fireburnt	500	**working sample**	working sample
Foreign material	50	**100**	250
Heated	50	**100**	100
Insect parts	working sample	**working sample**	working sample
Odour	working sample	**working sample**	working sample
Peeled, split and broken	25	**100**	100
Sclerotinia sclerotiorum	250	**500**	500
Stained	25	**50**	50
Stones	250	**working sample**	working sample

Grading factors

Ascochyta

Ascochyta is a fungal disease that attacks the lentil plant and seed. Any degree of white fungal growth on the seed is considered damaged. See *Damage.*

Representative portion for analysis
Minimum—25 g Optimum—100 g Export—100 g

Broken

See *Peeled, split and broken.*

Colour (CLR)

Colour is evaluated after the removal of stained and damaged lentils, using approved lentil colour guides.

Description used in grade determinants table	Characteristics
Good natural colour	Lentils that are sound, well matured and have a good natural colour.
Reasonably good natural colour	Lentils that are moderately immature, with light amounts of adhered soil or lightly discoloured from storage or other natural causes.
Fair colour	Lentils that are immature but not green, moderate amounts of adhered soil, or otherwise moderately discoloured from natural causes.
Poor colour	Lentils that do not meet the definition of fair colour, but are without severely adhered soil or are severely discoloured (dark brown).

The term sunburned or oxidation is used to describe the normal discolouration of the seed coat which occurs during storage. The colour may vary from light tan to brown or very dark brown, depending on the duration and conditions of storage.

Contaminated grain

▲ **Important:** Wear gloves and a mask to handle any sample that is suspected of containing contaminated grain.

Contaminated is defined in the *"Canada Grain Act"* as; "Contaminated means, in respect of grain, containing any substance in sufficient quantity that the grain is unfit for consumption by persons or animals or is adulterated within the meaning of the regulations made pursuant to sections B.01.046(1), B.15.001 and B.15.002(1) of the *Food and Drugs Act.*"

Samples deemed to be contaminated by the Grain Research Laboratory in consultation with the Chief Grain Inspector for Canada are graded *Lentils, Sample Condemned.*

Contrasting colours

Contrasting colours refers to cotyledon colour and significantly different seed coat colour.

- Cotyledons: red cotyledons contrast with yellow cotyledons
- Seed coats: dark-green speckled lentils contrast with green lentils

Damage (DMG)

Damaged lentils may be peeled, split, broken, sprouted, distinctly green, frost damaged, distinctly deteriorated or discoloured by weather or disease, insect damaged, heat damaged or otherwise damaged in a way which materially affects quality.

▲ **Important:** Kernels that are deformed are considered sound unless there is another reason for the damage beyond the deformity.

Representative portion for analysis

Minimum	Optimum	Export
Minimum—25 g	Optimum—50 g	Export—100 g

Earth pellets (EP)

- Hard earth pellets are pellets that do not crumble under light pressure. See *Stones*.
- Soft earth pellets are pellets that crumble under light pressure. See *Foreign material*.

Ergot (ERG)

Ergot is a plant disease producing elongated fungus bodies with a purplish-black exterior, a purplish-white to off white interior, and a relatively smooth surface texture.

Representative portion for analysis

Minimum	Optimum	Export
Minimum—500 g	Optimum—working sample	Export—working sample

Excreta (EXCR)

▲ **Important:** Wear gloves and a mask to handle any samples that you suspect may contain excreta.

Representative portion for analysis

Minimum	Optimum	Export
Minimum—working sample	Optimum—working sample	Export—working sample

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Fertilizer pellets (FERT PLTS)

Fertilizer pellets are typically either small, round and white or irregular shaped and pink or red. Fertilizer pellets are not considered a hazardous substance however there is no visible means of assuring that material resembling fertilizer pellets is not some other contaminant.

Representative portion for analysis

Minimum—working sample
Optimum—working sample
Export—working sample

Procedures

- Handpick any fertilizer pellets and determine the concentration basis the net working sample.
- Fertilizer pellets are assessed as stones when the concentration does not exceed 1.0% of the net sample weight.
- Samples containing fertilizer pellets in excess of 1.0% of the net sample weight are graded *Lentils, Held IP Suspect Contaminated Grain.*

Note: Canadian Grain Commission personnel should refer to ISO national work instruction "*Suspect Contaminated Grain, Handling Procedures*" for procedures to be followed when handling samples containing fertilizer pellets.

Fireburnt (FBNT)

Fireburnt seeds are seeds charred or scorched by fire. A cross-section of a fireburnt seed resembles charcoal with numerous air holes. The air holes result in a low weight seed which crumbles easily under pressure.

Representative portion for analysis

Minimum—working sample
Optimum—working sample
Export—working sample

Procedure

Samples of lentil containing any fireburnt seeds are graded *Lentil, Sample Canada Account Fireburnt.*

Foreign material (FM)

Foreign material includes anything that is not a lentil or part of a lentil.

Representative portion for analysis

Minimum—50 g
Optimum—100 g
Export—250 g

Frost damage (FR)

Frost damage is normally indicated by a combination of wrinkling and close adherence of the seed coat to the cotelydon. The seed coat may be translucent in appearance, and the cotyledons are brittle in texture. Frost damage is included in the tolerance for *Damage*.

Representative portion for analysis

Minimum—25 g	Optimum—50 g	Export—100 g

Procedures

1. Handpick all frost-damaged lentils.
2. Cut suspect frost-damaged lentils. Frost-damaged seeds are brittle when cut.

Heated (HTD)

Heated lentils are usually dark tan to black in appearance.

If sample contains ...	Then the grading factor is ...
Lentils with tan-coloured cotyledons and a distinct heated odour	*Heated*
Lentils with tan-coloured cotyledons and no odour	*Damage*

Representative portion for analysis

Minimum—50 g	Optimum—100 g	Export—100 g

Procedures

1. Handpick suspect heated lentils.
2. Cut suspect seeds to expose the cotyledons. Heated lentils have tan-coloured cotyledons.

Insect parts (I PARTS)

Insect parts refers to pieces of insects such as grasshoppers and lady bugs that remain in the sample after cleaning or processing. Samples are analyzed for the percentage of insect fragments and graded according to established tolerances.

If pulse crops come into contact with insects during the harvesting process, it may result in seed staining and earth adhering to the seed and may result in samples having an objectionable odour. Samples containing staining of this nature will be considered to be earth tagged and graded according to colour definitions. Samples having a distinct objectionable odour not associated with the quality of the grain will be graded *Type of Grain* Sample Account Odour.

Representative portion for analysis

Minimum—working sample	Optimum—working sample	Export—working sample

Odour (ODOR)

There is no numeric tolerance for odour. Consider
- The basic quality of the sample
- The type and degree of the odour
- The presence of visible residue causing the odour

Representative portion for analysis

Minimum—working sample	Optimum—working sample	Export—working sample

If odour is the grade determinant and there is . . .	Then the grade is . . .
An excessive objectionable odour not associated with the quality of the grain, but not heated or fireburnt	*Lentils, Sample Canada Account Odour*
An excessive heated odour	*Lentils, Sample Canada Account Heated*
An excessive fireburnt odour	*Lentils, Sample Canada Account Fireburnt*

Peeled, split and broken (PLDSPLTBKN)

Peeled, split and broken includes lentils which are otherwise sound but which are less than three-quarters of whole seeds or where less than one-half of the seed coat is intact.

Lentils with cracked or clipped seed coats are considered sound when the cotyledons are firmly held together.

Representative portion for analysis

Minimum—25 g	Optimum—100 g	Export—100 g

Rime (RIME)

Rime is the adhered lining of the seed pod. It is included in the general tolerance for Damage.

If the rime . . .	Then the grading is . . .
Completely and densely covers the lentils	*Damaged*
Is sparse enough to expose the soundness of the lentil	*Sound*—the rime is considered in the general appearance of the sample

Representative portion for analysis

Minimum—25 g	Optimum—50 g	Export—100 g

Sclerotinia sclerotiorum (SCL)

Sclerotinia sclerotiorum is a fungus producing hard masses of fungal tissue, called *sclerotia*. The sclerotia vary in size and shape, have a course surface texture, vary in exterior color from dark black to gray to white and have a pure white interior.

Representative portion for analysis

Minimum—250 g Optimum—500 g Export—500 g

Split

See *Peeled, split and broken*.

Sprouted (SPTD)

Lentils are considered sprouted when the seed coat splits and the primary root emerges from between the cotyledons. Sprouted is considered in the total tolerance for *Damage*.

Representative portion for analysis

Minimum—25 g Optimum—50 g Export—100 g

Stained (STND)

Stained lentils includes

- Mottled seeds—seeds with a significant number of distinct spots on the seed coat
- Water spot—seeds with distinct brown discolourations on the seed coat
- Ascochyta—seeds with dark-coloured lesions on the seed coat. Seeds with white fungal growth are also considered as damaged. See *Ascochyta.*
- Blue-black—seeds of green lentils with significant blue-black discolourartion of the seed coat. Seeds of varieties of lentils with dark-green speckled or coloured seed coats are considered as *Contrasting colours.*

Representative portion for analysis

Minimum—25 g Optimum—50 g Export—50 g

Procedure

Refer to digitally produced colour prints of stained lentils as a grading guide

Stones (STNS)

Stones are hard shale, coal, hard earth pellets, and any other non toxic materials of similar consistency. Fertilizer pellets are assessed as stones when constituting 1.0% or less of the net sample weight. (See *Fertilizer pellets* for specific procedures to be followed when samples contain fertilizer pellets.)

Representative portion for analysis

Minimum—250 g
Optimum—working sample
Export—working sample

Procedures

1. Handpick stones from a representative portion of the cleaned sample.
2. Determine stone concentration in the net sample.

- In western Canada samples of grain containing stones in excess of "basic grade" tolerances, up to 2.5% are graded *Lentils, Rejected "basic grade" Account Stones*. The "*basic grade*" refers to a grade established in the Canada Grain Regulations (grades listed in the first column in grade determinant tables) that would have been assigned to the sample if it contained no stones.
- In eastern Canada samples of grain containing stones in excess of grade tolerances are degraded to lower grades. Samples containing stones in excess of the tolerance of the lowest grade established by regulation up to 2.5% are graded *Lentils, Sample Canada Account Stones.*
- In western and eastern Canada grain containing more than 2.5% stones is graded *Lentils, Sample Salvage.*

Examples: Western Canada

Excerpt from grade determinant tables for
Lentils, Canada Red

Grade name	Stones %
No. 1 Canada Red	0.1
No. 2 Canada Red	0.2
Extra No. 3 Canada Red	0.2
No. 3 Canada Red	0.2

Basic grade:......................... *Lentils, No. 1 Canada Red*

If the above sample contained	Grade in western Canada
0.2% stones	*Lentils, Rejected No. 1 Canada Red Account Stones*
1.0% stones	*Lentils, Rejected No. 1 Canada Red Account Stones*
3.0% stones	*Lentils, Sample Salvage*

Examples: Eastern Canada

Excerpt from grade determinant tables for
Lentils, Canada Red

Grade name	Stones %
No. 1 Canada Red	0.1
No. 2 Canada Red	0.2
Extra No. 3 Canada Red	0.2
No. 3 Canada Red	0.2

Basic grade:......................... *Lentils, No. 1 Canada Red*

If the above sample contained	Grade in eastern Canada
0.2% stones	*Lentils, No. 2 Canada Red*
1.0% stones	*Lentils, Sample Canada Red Account Stones*
3.0% stones	*Lentils, Sample Salvage*

Treated seed and other chemical substances

Treated seed

Treated seed is grain that has been coated with an agricultural chemical for agronomic purposes. These seed dressings contain a dye to render the treated seed visually conspicuous. The colour of the dye varies depending upon the type of treatment and the type of grain. The current Canadian colour standards for pesticide seed treatments are: cereals–pink or red, canola–baby blue or green. Seed treated with an inoculant may have a green stain. The coatings or stains may appear greasy or powdery and surface area distribution ranges from tiny flecks to complete coverage.

Other chemical substances

Other chemical substances refers to any chemical residues either adhering to the kernel or remaining in the sample and to samples having a chemical odour of any kind.

▲ **Important:** Wear gloves and a mask to handle any samples that you suspect may contain contaminated grain.

Representative portion for analysis

Minimum—working sample
Optimum—working sample
Export—working sample

If a sample is suspected of being coated with a pesticide, desiccant, inoculant or if the sample contains evidence of any foreign chemical substance other than fertilizer pellets, the sample shall be graded *Lentils, Held IP Suspect Contaminated Grain*.

Note: Canadian Grain Commission personnel should refer to ISO national work instruction "*Suspected Contaminated Grain, Handling Procedures*" for specific procedures to be followed when handling samples suspected of containing treated seed or other chemical substances.

Variety

On written request, the lentil variety forms part of the grade name, for example, No. 1 Canada, Laird.

▲ **Important**: State "Varietal purity not guaranteed" in the remarks section of grading certificates.

Primary and export grade determinants tables

Lentils, Canada, other than Red (CAN)

	Standard of quality			Damage			
Grade name	**Degree of soundness**	**Contrasting colours**	**Stained %**	**Heated %**	**Peeled, split and broken %**	**Other damage %**	**Total %**
No. 1 Canada	Uniform size, good natural colour	0.2	1	0.2	2.0	1.0	2.0
No. 2 Canada	Uniform size, reasonably good natural colour	0.5	4	0.5	3.5	2	3.5
Extra No. 3 Canada	Uniform size, fair colour	2	7	0.5	5	5	5
No. 3 Canada	Poor colour	3	No limit	1	10	10	10
Grade, if No. 3 specs not met		*Lentils, Sample Canada Account Contrasting Colours*		*Lentils, Sample Canada Account Heated*	*Lentils, Sample Canada Account Damaged*	*Lentils, Sample Canada Account Damaged*	*Lentils, Sample Canada Account Damaged*

	Foreign material						
Grade name	**Ergot %**	**Excreta %**	**Insect parts %**	**Sclerotinia %**	**Stones %**	**Other foreign material %**	**Total %**
No. 1 Canada	0.05	0.01	0.02	0.05	0.10	0.2	0.2
No. 2 Canada	0.05	0.01	0.02	0.05	0.2	0.5	0.5
Extra No. 3 Canada	0.05	0.01	0.02	0.05	0.2	0.5	0.5
No. 3 Canada	0.05	0.01	0.02	0.05	0.2	1	1
Grade, if No. 3 specs not met	*Lentils, Sample Canada Account Ergot*	*Lentils, Sample Canada Account Excreta*	*Lentils, Sample Canada Account Admixture*	*Lentils, Sample Canada Account Admixture*	2.5% or less—*Lentils, Rejected (grade) Account Stones*, or *Lentils, Sample Canada Account Stones* Over 2.5%—*Lentils, Sample Salvage*	*Lentils, Sample Canada Account Admixture*	*Lentils, Sample Canada Account Admixture*

Lentils, Canada Red (CAN)

Grade name	Standard of quality	Contrasting colours	Damage			
	Degree of soundness		Heated %	Peeled, split and broken %	Other damage %	Total %
No. 1 Canada	Uniform size, good natural colour	0.2	0.2	2.0	1.0	2.0
No. 2 Canada	Uniform size, reasonably good natural colour	0.5	0.5	3.5	2	3.5
Extra No. 3 Canada	Uniform size, fair colour	2	0.5	5	5	5
No. 3 Canada	Poor colour	3	1	10	10	10
Grade, if No. 3 specs not met		*Lentils, Sample Canada Red Account Contrasting Colours*	*Lentils, Sample Canada Red Account Heated*	*Lentils, Sample Canada Red Account Damaged*	*Lentils, Sample Canada Red Account Damaged*	*Lentils, Sample Canada Red Account Damaged*

Grade name	Foreign material						
	Ergot %	Excreta %	Insect parts %	Sclerotinia %	Stones %	Other foreign material %	Total %
No. 1 Canada	0.05	0.01	0.02	0.05	0.10	0.2	0.2
No. 2 Canada	0.05	0.01	0.02	0.05	0.2	0.5	0.5
Extra No. 3 Canada	0.05	0.01	0.02	0.05	0.2	0.5	0.5
No. 3 Canada	0.05	0.01	0.02	0.05	0.2	1	1
Grade, if No. 3 specs not met	*Lentils, Sample Canada Red Account Ergot*	*Lentils, Sample Canada Red Account Excreta*	*Lentils, Sample Canada Red Account Admixture*	*Lentils, Sample Canada Red Account Admixture*	2.5% or less— *Lentils, Rejected (grade) Account Stones*, or *Lentils, Sample Canada Red Account Stones* Over 2.5%—*Lentils, Sample Salvage*	*Lentils, Sample Canada Red Account Admixture*	*Lentils, Sample Canada Red Account Admixture*

Export shipments

Shipments can be commercially clean or not commercially clean.

Commercially clean (CC)

Shipments are considered commercially clean when they contain 0.2% or less by weight of dockage material. No dockage is reported.

Not commercially clean (NCC)

Shipments that do not meet the standards for commercial cleanliness are referred to as not commercially clean. Such shipments are allowed only with the permission of the CGC.

For samples representing not commercially clean shipments approved by the CGC for shipment from terminal and transfer elevators, dockage is reported to the nearest

- 0.1% for samples representing commercially clean shipments loaded from a single terminal or transfer elevator
- 0.01% for composite samples representing shipments loaded from more than one terminal or transfer elevator

less a direct deduction of up to 0.2% to take into account the buildup of attritional material.

Processed shipments

For samples representing processed shipments from other than terminal and transfer elevators, dockage is reported to the nearest 0.1% and consists of the following

- Material that remains on top of the riddle, other than whole lentils which are handpicked and returned to the cleaned sample
- Material that passes through the selected sieve
- Material removed by aspiration
- Small broken lentils and portions of lentils whose weight exceeds 0.2% of the sample weight and which are removable through the No. 10 round-hole sieve and by aspiration

Grading

Where there are no export specifications, the primary specifications are used.

19. Beans

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Determination of dockage

Definitions

Dockage is assessed and recorded to the nearest 0.1%. Dockage is assessed only on unprocessed samples of beans.

Dockage is defined under the Canada Grain Act as "any material intermixed with a parcel of grain, other than kernels of grain of a standard of quality fixed by or under this Act for a grade of that grain, that must and can be separated from the parcel of grain before that grade can be assigned to the grain." Dockage is removed by following the cleaning procedures described in this chapter.

The sample as it arrives is referred to as the uncleaned or dirty sample. Its weight is the **gross weight** of the sample. Dockage is assessed on the gross weight of the sample.

Dockage not reported

▲ **Important:** Dockage is not reported for samples grading

- *Beans, Sample Canada (class) Account Fireburnt*
- *Beans, Sample Salvage*
- *Beans, Sample Condemned*

Normal cleaning procedures

▲ **Important:** Wear gloves and a mask to handle any samples that you suspect may contain hazaradous substances.

Dockage is assessed only on unprocessed samples of beans. All foreign material in processed samples is assessed as grading factors.

1. Using a Boerner-type divider, divide the uncleaned sample to obtain a representative portion.
   - Official samples should be at least 900 grams.
   - Unofficial samples should be at least 750 grams.
2. Choose the appropriate hand sieve for the size of the bean.

   No. 8 slotted
   No. 9 slotted
   No. 11 slotted
3. Sieve the samples over the appropriate slotted sieve, using approximately 250 g at a time, to remove all readily removable material.
4. Handpick the portion remaining on top of the slotted sieve to remove all coarse foreign vegetable matter such as pods, stems, straw, thistle tops.

   ▲ **Important:** Do not remove mineral matter, ergot, sclerotinia, weed seeds or other grains.
5. Determine dockage. Use the list under *Composition of dockage*.

Composition of dockage

Dockage includes

- All material removed by sieving or handpicking or both, as defined in the previous section
- Soft earth pellets, which are pellets that crumble under light pressure, including earth pellets, fertilizer pellets, or pellets of any non-toxic material of similar consistency
- In unprocessed samples, mudballs handpicked from the cleaned sample

Optional analysis

Where a shipper requests special cleaning of a carlot of grain at a terminal or transfer elevator, and the elevator manager agrees, dockage material will be analyzed for the presence of grain. The percentage and grade of any grain contained in the dockage will be reported and elevator stocks will be adjusted on the basis of the analysis. Agreement of the shipper and unload elevator must be conveyed to the CGC in writing prior to the analysis being performed.

Procedures

1. Analyze the official sample.
2. Record the following on inspection records:
   - The percentage by gross weight to the nearest 0.1% and the grade of beans.
   - The percentage by gross weight to the nearest 0.1% and the grade of grain separable from dockage.
   - The percentage of dockage.

   Example
   95.0% Beans No. 1 CAN Cranberry
   4.0% Domestic Mustard Seed, No. 1 CAN Oriental
   1.0% dockage

Grading

Important definitions

Net weight of sample

The sample after cleaning and removal of dockage is referred to as the cleaned sample. Its weight is the net weight of the sample. Percentages by weight for grading refer to percentages of the net weight.

Hazardous substances in samples

Wear gloves and a mask to handle any samples that you suspect may contain hazardous substances. Hazardous substances are defined in the Regulations as "any pesticide, herbicide or desiccant."

Representative portion for grading

All grading is done on representative portions divided down from the cleaned sample, using a Boerner-type divider.

When the concentration of the grading factor is . .	Then use . . .
Low	Optimum portion
High	Minimum portion or more **(do not use less)**

Values in this table represent a range of recommended portions of samples for grading.

Representative portion of beans for grading, grams

Grading factor	Minimum	Optimum	Export
Contrasting classes	100	**500**	500
Damage	100	**500**	500
Ergot	500	**working sample**	working sample
Excreta	working sample	**working sample**	working sample
Fireburnt	working sample	**working sample**	working sample
Foreign material	100	**500**	500
Heated, rotted, mouldy	100	**500**	500
Insect parts	working sample	**working sample**	working sample
Odour	working sample	**working sample**	working sample
Other classes of beans that blend	250	**500**	500
Sclerotinia sclerotiorum	500	**working sample**	working sample
Splits	100	**500**	500
Stones	100	**working sample**	working sample

Grading factors

Adhered soil

Adhered soil is soil which clings to beans.

Representative portion for analysis

Minimum—100 g	Optimum—500 g	Export—500 g

Procedures

- Completely covered beans are called mudball beans. See *Mudball beans*.
- Otherwise, assess the amount of adhered soil against the colour standard.

Broken (BKN)

See *Splits*

Classes

There are numerous classes of beans; for example, cranberry beans, blackeye beans, turtle beans. The class of beans forms part of the grade name; for example, *Beans, No. 1 Canada Cranberry*.

Colour (CLR)

Colour is evaluated on the cleaned sample after the removal of splits and damaged beans. There is no numeric tolerance for colour. It is included in the evaluation of the standard of quality of the sample.

Standard of quality	Description (for grading)
Good natural colour	Beans may be slightly dull, slightly immature or have lightly adhered soil.
Reasonably good colour	Beans are moderately immature, with lightly adhered soil, or are lightly stained, or are lightly discoloured from storage.
Fairly good colour	Beans have moderately adhered soil or are stained, or moderately discoloured from storage.
Off colour	Beans cannot be considered of fairly good colour.

Sunburned or oxidized

In assessing colour which does not meet grade standards, you may also use the term *Sunburned or oxidized*, which is a normal discolouration of the seed coat occurring during storage. The colour may vary from light tan to brown or very dark brown, depending on the duration and conditions of storage.

Representative portion for analysis

Minimum—working sample	Optimum—working sample	Export—working sample

Procedure

Colour is assessed against the colour standard for the grade.

Contaminated grain

▲ **Important:** Wear gloves and a mask to handle any sample that is suspected of containing contaminated grain.

Contaminated is defined in the *"Canada Grain Act"* as; "Contaminated means, in respect of grain, containing any substance in sufficient quantity that the grain is unfit for consumption by persons or animals or is adulterated within the meaning of the regulations made pursuant to sections B.01.046(1), B.15.001 and B.15.002(1) of the *Food and Drugs Act*."

Samples deemed to be contaminated by the Grain Research Laboratory in consultation with the Chief Grain Inspector for Canada are graded *Beans, Sample Condemned.*

Contrasting classes (CON CL)

Beans of another class that contrast in colour, size or shape to the predominant beans in a sample are considered to be of a contrasting class.

Representative portion for analysis

Minimum—100 g	Optimum—500 g	Export—500 g

Damage (DMG)

Damaged beans include

- Whole, split, or broken beans that are sprouted, very immature, perforated, distinctly deteriorated or discoloured by weather or disease.
- Beans that are otherwise damaged in a way that seriously affects appearance or quality. This includes mudball beans in processed beans.

Representative portion for analysis

Minimum—100 g	Optimum—500 g	Export—500 g

Procedures

Beans showing some indication of possible internal damage are to be cut for confirmation of damage.

▲ **Important:** Damage is the most detrimental grading factor.
Refer to the Order of Precedence.

Earth pellets (EP)

- Hard earth pellets are pellets that do not crumble under light pressure.
  See *Stones*.
- Soft earth pellets are pellets that crumble under light pressure.
  See *Soft earth pellets*.

Ergot (ERG)

Ergot is a plant disease producing elongated fungus bodies with a purplish-black exterior, a purplish-white to off white interior, and a relatively smooth surface texture.

Representative portion for analysis

Minimum—500 g	Optimum—working sample	Export—working sample

Excreta (EXCR)

▲ **Important**: Wear gloves and a mask to handle any samples that you suspect may contain excreta.

Representative portion for analysis

Minimum—working sample
Optimum—working sample
Export—working sample

Fertilizer pellets (FERT PLTS)

Fertilizer pellets are typically either small, round and white or irregular shaped and pink or red. Fertilizer pellets are not considered a hazardous substance however there is no visible means of assuring that material resembling fertilizer pellets is not some other contaminant.

Representative portion for analysis

Minimum—working sample
Optimum—working sample
Export—working sample

Procedures

- Handpick any fertilizer pellets and determine the concentration basis the net working sample.
- Fertilizer pellets are assessed as stones when the concentration does not exceed 1.0% of the net sample weight.
- Samples containing fertilizer pellets in excess of 1.0% of the net sample weight are graded *Beans, Held IP Suspect Contaminated Grain.*

Note: Canadian Grain Commission personnel should refer to ISO national work instruction "*Suspect Contaminated Grain, Handling Procedures*" for procedures to be followed when handling samples containing fertilizer pellets.

Fireburnt (FBNT)

Fireburnt beans are beans charred or scorched by fire. A cross-section of a fireburnt bean resembles charcoal with numerous air holes. The air holes result in a low weight bean which crumbles easily under pressure.

Representative portion for analysis

Minimum—working sample
Optimum—working sample
Export—working sample

Procedure

Samples of beans containing any fireburnt seeds are graded *Beans, Sample Canada (class) Account Fireburnt.*

Foreign material (FM)

This includes any material other than beans or split beans not removed in cleaning.

Representative portion for analysis

Minimum—100 g
Optimum—500 g
Export—500 g

Heated (HTD)

Heated, rotted, and mouldy are included in the same tolerance.

Pea beans

Heating is indicated by a dull seed coat varying from cream to mahogany in colour. The colour is more intense in the hilum area. When viewed in cross-section, the cotyledons vary in colour from tan to dark brown. Very light tan cotyledons are considered damaged rather than heated.

Red kidney beans

Heating is indicated by a dull seed coat, dark red to black in colour.

Representative portion for analysis

Minimum—100 g Optimum—500 g Export—500 g

Procedure

To determine the degree of damage, split the bean. Do not cut it crosswise.

Insect parts (I PARTS)

Insect parts refers to pieces of insects such as grasshoppers and lady bugs that remain in the sample after cleaning or processing. Samples are analyzed for the percentage of insect fragments and graded according to established tolerances.

If pulse crops come into contact with insects during the harvesting process, it may result in seed staining and earth adhering to the seed and may result in samples having an objectionable odour. Samples containing staining of this nature will be considered to be earth tagged and graded according to colour definitions. Samples having a distinct objectionable odour not associated with the quality of the grain will be graded *Type of Grain* Sample Account Odour.

Representative portion for analysis

Minimum—working sample Optimum—working sample Export—working sample

Magnesium spot

Magnesium spot is a black spot penetrating the cotyledon, most commonly found in cranberry beans. Affected beans are considered damaged.

Representative portion for analysis

Minimum—100 g Optimum—250 g Export—100 g

Procedures

Initially separate all beans where there is a "suspicion" of internal damage. This "suspicion" will be based on external characteristics or discolouration on the surface of the beans which indicates that the cotyledons may be damaged. Only suspect beans are to be cut and assessed for damage.

Mouldy (MLDY)

Mouldy beans are characterized by the presence of dark blue exterior moulds that develop in machine-damaged crevices. Light and dark red kidney beans may develop yellow to black interior moulds in the concave centre area. Heated, rotted, and mouldy are included in the same tolerance.

Representative portion for analysis

Minimum—100 g	Optimum—500 g	Export—500 g

Mudball beans

Mudball beans are beans that are completely covered with caked-on mud.

- In processed samples, mudball beans are considered *Damage*.
- In unprocessed samples, mudball beans are considered dockage.

Odour (ODOR)

There is no numeric tolerance for odour. Consider

- The basic quality of the sample
- The type and degree of the odour
- The presence of visible residue causing the odour

Representative portion for analysis

Minimum—working sample	Optimum—working sample	Export—working sample

If odour is the grade determinant and there is . . .	Then the grade is . . .
An objectionable odour, not heated or fireburnt	*Beans, Sample Canada Account Odour*
A heated odour	*Beans, Sample Canada Account Heated*
A fireburnt odour	*Beans, Sample Canada Account Fireburnt*

Other classes of beans that blend (OCLBB)

Classes of beans that blend are sound beans of other classes which are similar in colour, size and shape to the predominant beans in a sample.

Representative portion for analysis

Minimum—250 g	Optimum—500 g	Export—500 g

Rotted (ROT)

Rotted beans are whole beans or pieces of beans that are visibly in advanced stages of decomposition and that feel spongy under pressure. Heated, rotted, and mouldy are included in the same tolerance.

Representative portion for analysis

Minimum—100 g	Optimum—500 g	Export—500 g

Sclerotinia sclerotiorum (SCL)

Sclerotinia sclerotiorum is a fungus producing hard masses of fungal tissue, called *sclerotia*. The sclerotia vary in size and shape, have a course surface texture, vary in exterior color from dark black to gray to white and have a pure white interior.

Representative portion for analysis

Minimum—500 g	Optimum—working sample	Export—working sample

Soft earth pellets (SEP)

Soft earth pellets are pellets that crumble under light pressure—if they do not crumble, they are considered *Stones*. These pellets can be

- Earth and fertilizer pellets
- Any non-toxic material of similar consistency

Earth pellets are classed as foreign material.

Splits (SPLT)

Splits include split beans, broken pieces of beans that are less than three-quarters of whole kernels, and halves of beans that are loosely held together by cracked seed coats.

▲ **Important:** Splits do not include beans that are otherwise damaged. In other words, if a split is damaged, it is graded as *Damage*, not as splits.

Representative portion for analysis

Minimum—100 g	Optimum—500 g	Export—500 g

Procedures

Use a slotted sieve to help separate splits. Return to the sample any whole beans which pass through the sieve.

Stones (STNS)

Stones are hard shale, coal, hard earth pellets, and any other non toxic materials of similar consistency. Fertilizer pellets are assessed as stones when constituting 1.0% or less of the net sample weight. (See *Fertilizer pellets* for specific procedures to be followed when samples contain fertilizer pellets.)

Representative portion for analysis

Minimum—250 g
Optimum—working sample
Export—working sample

Procedures

1. Handpick stones from a representative portion of the cleaned sample.
2. Determine stone concentration in the net sample.

- In western Canada samples of grain containing stones in excess of "basic grade" tolerances, up to 2.5% are graded *Beans, Rejected "basic grade" Account Stones*. The "*basic grade*" refers to a grade established in the Canada Grain Regulations (grades listed in the first column in grade determinant tables) that would have been assigned to the sample if it contained no stones.
- In eastern Canada samples of grain containing stones in excess of grade tolerances are degraded to lower grades. Samples containing stones in excess of the tolerance of the lowest grade established by regulation up to 2.5% are graded *Beans, Sample Canada Account Stones.*
- In western and eastern Canada grain containing more than 2.5% stones is graded *Beans, Sample Salvage.*

Examples: Western Canada

Excerpt from grade determinant tables for
Beans, Canada Cranberry, Blackeye or Yelloweye Canada

Grade name	Stones %
Extra No. 1 Canada	Nil
No. 1 Canada	0.05
No. 1 Canada Select	0.05
No. 2 Canada	0.1
No. 3 Canada	0.2
No. 4 Canada	0.5

Basic grade:......................... *Beans, No. 2 Canada Cranberry*
Reason for basic grade:....... 0.2% Heated

If the above sample contained	Grade in western Canada
0.2% stones	*Beans, Rejected No. 2 Canada Cranberry Account Stones*
1.0% stones	*Beans, Rejected No. 2 Canada Cranberry Account Stones*
3.0% stones	*Beans, Sample Salvage*

Examples: Eastern Canada

Excerpt from grade determinant tables for
Beans, Canada Cranberry, Blackeye or Yelloweye Canada

Grade name	Stones %
Extra No. 1 Canada	Nil
No. 1 Canada	0.05
No. 1 Canada Select	0.05
No. 2 Canada	0.1
No. 3 Canada	0.2
No. 4 Canada	0.5

Basic grade:......................... *Beans, No. 2 Canada Cranberry*
Reason for basic grade:....... 0.2% Heated

If the above sample contained	Grade in eastern Canada
0.2% stones	*Beans, No. 3 Canada Cranberry*
1.0% stones	*Beans, Sample Canada Cranberry Account Stones*
3.0% stones	*Beans, Sample Salvage*

Treated seed and other chemical chemical substances

Treated seed

Treated seed is grain that has been coated with an agricultural chemical for agronomic purposes. These seed dressings contain a dye to render the treated seed visually conspicuous. The colour of the dye varies depending upon the type of treatment and the type of grain. The current Canadian colour standards for pesticide seed treatments are: cereals–pink or red, canola–baby blue or green. Seed treated with an inoculant may have a green stain. The coatings or stains may appear greasy or powdery and surface area distribution ranges from tiny flecks to complete coverage.

Other chemical substances

Other chemical substances refers to any chemical residues either adhering to the kernel or remaining in the sample and to samples having a chemical odour of any kind.

▲ **Important:** Wear gloves and a mask to handle any samples that you suspect may contain contaminated grain.

Representative portion for analysis

Minimum—working sample	Optimum—working sample	Export—working sample

If a sample is suspected of being coated with a pesticide, desiccant, inoculant or if the sample contains evidence of any foreign chemical substance other than fertilizer pellets, the sample shall be graded *Beans, Held IP Suspect Contaminated Grain*.

Note: Canadian Grain Commission personnel should refer to ISO national work instruction "*Suspect Contaminated Grain, Handling Procedures*" for specific procedures to be followed when handling samples suspected of containing treated seed or other chemical substances.

Variety

Beans are graded without reference to variety.

Special analyses

Upon request, samples may be analyzed for other factors. The shipper of the beans indicates which factors are to be analyzed and which sieves to use.

Split beans

Use a slotted sieve to help in separating splits from whole beans.

Record all percentages to two decimal places.

Factor	Minimum representative portion to analyse g
Foreign material	500
Sound whole or sound splits	100
Damaged whole or damaged splits	100

Cracked seed coats (CSDC)

Cracked seed coats include

- Beans with any cracked seed coats
- Beans with a piece of seed coat missing

Beans with a seed coat punctured by insect or other means

Primary and export grade determinants tables

Pea Beans, Canada (CAN)

Grade name	Standard of quality	Other classes that blend %
Extra No. 1 Canada	Uniform size, good natural colour	1
Canada No. 1 Select	Fairly good colour	1
No. 1 Canada	Reasonably good colour	1
No. 2 Canada	Fairly good colour	5
No. 3 Canada	Fairly good colour	5
No. 4 Canada	Off-colour	5
Grade, if No. 4 specs not met		*Pea Beans, Sample Canada Account Other Classes That Blend*

	Foreign material								
Grade name	**Ergot %**	**Insect parts %**	**Sclerotinia %**	**Stones, shale or similar material %**	**Total %**	**Contrasting classes %**	**Heated, rotted, mouldy %**	**Total damage, foreign material, and contrasting classes %**	**Total damage, including splits, foreign material and contrasting classes %**
Extra No. 1 Canada	0.05	0.02	0.05	0.01	0.05	0.1	Nil	1.0	1.0
Canada No. 1 Select	0.05	0.02	0.05	0.01	0.05	0.1	0.20	1.5	2.0
No. 1 Canada	0.05	0.02	0.05	0.05	0.10	0.1	0.10	1.5	2.0
No. 2 Canada	0.05	0.02	0.05	0.10	0.20	1	0.20	3	4
No. 3 Canada	0.05	0.02	0.05	0.20	0.5	1	0.3	5	6
No. 4 Canada	0.05	0.02	0.05	0.20	0.5	1	1.0	**8.5**	10
Grade, if No. 4 specs not met	*Pea Beans, Sample Canada Account Ergot*	*Pea Beans, Sample Canada Account Admixture*	*Pea Beans, Sample Canada Account Admixture*	2.5% or less—*Pea Beans, Rejected (grade) Account Stones*, or *Pea Beans, Sample Canada Account Stones* Over 2.5%—*Pea Beans, Sample Salvage*	*Pea Beans, Sample Canada Account Admixture*	*Pea Beans, Sample Canada Account Contrasting Classes*	*Pea Beans, Sample Canada Account Heated* or *Account Mouldy Kernels*	*Pea Beans, Sample Canada Account (reason)*	*Pea Beans, Sample Canada, Account (reason)*

Beans, Canada Cranberry, Blackeye or Yelloweye (CAN)

Grade name	Standard of quality	Other classes that blend %
Extra No. 1 Canada	Uniform size, good natural colour	1
No. 1 Canada	Reasonably good colour	3
No. 1 Canada Select	Fairly good colour	3
No. 2 Canada	Fairly good colour	5
No. 3 Canada	Fairly good colour	10
No. 4 Canada	Off-colour	15
Grade, if No. 4 specs not met		*Beans, Sample Canada (class) Account Other Classes That Blend*

	Foreign material								
Grade name	Ergot %	Insect parts %	Sclerotinia %	Stones, shale or similar material %	Total %	Contrasting classes %	Heated, rotted, mouldy %	Total damage, foreign material, and contrasting classes %	Total damage, including splits, foreign material and contrasting classes %
Extra No. 1 Canada	0.05	0.02	0.05	Nil	0.05	1.0	Nil	1.0	1.0
No. 1 Canada	0.05	0.02	0.05	0.05	0.10	1.5	0.10	1.5	3.5
No. 1 Canada Select	0.05	0.02	0.05	0.05	0.10	1.5	0.10	1.5	3.5
No. 2 Canada	0.05	0.02	0.05	0.10	0.20	3	0.20	3	5.5
No. 3 Canada	0.05	0.02	0.05	0.20	0.5	5	0.3	5	7.5
No. 4 Canada	0.05	0.02	0.05	0.50	1.0	8.5	1.0	8	10
Grade, if No. 4 specs not met	*Beans, Sample Canada (class) Account Ergot*	*Beans, Sample Canada (class) Account Admixture*	*Beans, Sample Canada (class) Account Admixture*	2.5% or less—*Beans, Rejected (grade) (class) Account Stones*, or *Beans, Sample Canada (class) Account Stones* Over 2.5%—*Beans, Sample Salvage*	*Beans, Sample Canada Account Admixture*	*Beans, Sample Canada (class) Account Contrasting Classes*	*Beans, Sample Canada (class) Account Heated* or *Account Mouldy Kernels*	*Beans, Sample Canada (class) Account (reason)*	*Beans, Sample Canada (class) Account (reason)*

Note: The class name is added to the grade name.

Beans, Canada, other than Cranberry, Blackeye, Yelloweye or Pea Beans (CAN)

Grade name	Standard of quality	Other classes that blend %
Extra No. 1 Canada	Uniform size, good natural colour	1
No. 1 Canada	Reasonably good colour	3
No. 1 Canada Select	Fairly good colour	3
No. 2 Canada	Fairly good colour	5
No. 3 Canada	Fairly good colour	10
No. 4 Canada	Off-colour	15
Grade, if No. 4 specs not met		*Beans, Sample Canada (class) Account Other Classes That Blend*

Grade name	Foreign material					Contrasting classes %	Heated, rotted, mouldy %	Total damage, foreign material, and contrasting classes %	Total damage, including splits, foreign material and contrasting classes %
	Ergot %	Insect parts %	Sclerotinia %	Stones, shale or similar material %	Total %				
Extra No. 1 Canada	0.05	0.02	0.05	Nil	0.05	1.0	Nil	1.0	1.0
No. 1 Canada	0.05	0.02	0.05	0.05	0.10	1.5	0.10	1.5	2.0
No. 1 Canada Select	0.05	0.02	0.05	0.05	0.10	1.5	0.10	1.5	2.0
No. 2 Canada	0.05	0.02	0.05	0.10	0.20	3	0.20	3	4
No. 3 Canada	0.05	0.02	0.05	0.20	0.5	5	0.3	5	6
No. 4 Canada	0.05	0.02	0.05	0.50	1.0	8.5	1.0	8.5	10
Grade, if No. 4 specs not met	*Beans, Sample Canada (class) Account Ergot*	*Beans, Sample Canada (class) Account Admixture*	*Beans, Sample Canada (class) Account Admixture*	2.5% or less—*Beans, Rejected (grade) (class) Account Stones*, or *Beans, Sample Canada (class) Account Stones* Over 2.5%—*Beans, Sample Salvage*	*Beans, Sample Canada Account Admixture*	*Beans, Sample Canada (class) Account Contrasting Classes*	*Beans, Sample Canada (class) Account Heated* or *Account Mouldy Kernels*	*Beans, Sample Canada (class) Account (reason)*	*Beans, Sample Canada (class) Account (reason)*

Note: The class name is added to the grade name.

Export shipments

Shipments can be commercially clean or not commercially clean.

Commercially clean (CC)

Shipments are considered commercially clean when they contain no dockage material.

Not commercially clean (NCC)

Shipments that do not meet the standards for commercial cleanliness are referred to as not commercially clean. Such shipments are permitted only with the permission of the CGC.

For samples representing not commercially clean shipments approved by the CGC for shipment from terminal and transfer elevators, dockage is reported to the nearest

- 0.1% for samples representing commercially clean shipments loaded from a single terminal or transfer elevator
- 0.01% for composite samples representing shipments loaded from more than one terminal or transfer elevator

less a deduction of up to 0.2% to take into account the buildup of attritional material..

Grading

Beans on export are graded in accordance with primary standards and specifications.

20. Soybeans

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Determination of dockage

Dockage is assessed and recorded to the nearest 0.1%.

Dockage is defined under the Canada Grain Act as "any material intermixed with a parcel of grain, other than kernels of grain of a standard of quality fixed by or under this Act for a grade of that grain, that must and can be separated from the parcel of grain before that grade can be assigned to the grain." Dockage is removed by following the cleaning procedures described in this section of the guide.

The sample as it arrives is referred to as the uncleaned or dirty sample. Its weight is the **gross weight** of the sample. Dockage is assessed on the gross weight of the sample.

▲ **Important:** Dockage is not reported for samples graded as

- *Soybeans, Sample Canada (colour) Account Fireburnt*
- *Soybeans, Sample Salvage*
- *Soybeans, Sample Condemned*

Normal cleaning procedures

▲ **Important:** Wear gloves and a mask to handle any samples that you suspect may contain hazardous substances.

Samples that are commercially clean do not go through the Carter dockage tester.

1. Using a Boerner-type divider, divide the uncleaned sample to obtain a representative portion.
   - Official samples should be at least 900 g.
   - Unofficial samples should be at least 750 g.
2. Sieve the samples over the No. 8 round-hole hand sieve, using approximately 250 g at a time, to remove all readily removable material.
3. Set up the Carter dockage tester as follows:

Feed control	#10
Air control	#7
Riddle	none
Top sieve	blank tray
Centre sieve	none
Bottom sieve	none
Sieve cleaner control	off

4. Turn on the Carter dockage tester.
5. Pour the sample into the hopper.

6. After the sample has passed through the machine, turn off the machine.
7. Lightly snap the retainer rod of the aspiration pan to loosen material gathered on the air screen.
8. Determine dockage, using the list under *Composition of dockage*.

Composition of dockage

- Material passing through the No. 8 round-hole sieve
- Up to 10.0% by weight of soft earth pellets handpicked from the sample
- Stems, pods, hulls, loose soybean seed coats, and coarse vegetable matter removed through aspiration with the Carter dockage tester, or handpicked from the sample.

▲ **Important:** Return all pieces of soybeans or whole soybeans, sclerotinia, ergot, weed seeds or other grains removed by aspiration to the sample where they are assessed as grading factors.

Aspiration is used only as an aid to help speed up the removal of lightweight dockage material from the sample.

Optional analysis

Where a shipper requests special cleaning of a carlot of grain at a terminal or transfer elevator, and the elevator manager agrees, dockage material will be analyzed for the presence of grain. The percentage and grade of any grain contained in the dockage will be reported and elevator stocks will be adjusted on the basis of the analysis. Agreement of the shipper and unload elevator must be conveyed to the CGC in writing prior to the analysis being performed.

Procedures

1. Analyze the official sample.
2. Record the following on inspection records:
    - The percentage by gross weight to the nearest 0.1% and the grade of soybeans.
    - The percentage by gross weight to the nearest 0.1% and the grade of grain separable from dockage.
    - The percentage of dockage.

    Example
    95.0% Soybeans, No. 1 CAN, Yellow
    4.0% Domestic Mustard Seed, No. 1 CAN Oriental
    1.0% dockage

Grading

Important definitions

Net weight of sample

The sample after cleaning and removal of dockage is referred to as the cleaned sample. Its weight is the net weight of the sample. Percentages by weight for grading refer to percentages of net weight.

Kernel counts (K)

- To do kernel counts you must have 500 grams of cleaned sample.
- All grading is done on representative portions divided down from the cleaned sample using a Boerner-type divider.

Hazardous substances in samples

Wear gloves to handle any samples that you suspect may contain hazardous substances. Hazardous substances are defined in the Regulations as "any pesticide, herbicide or desiccant."

Representative portions for grading

All grading is done on representative portions divided down from the cleaned sample, using a Boerner-type divider.

When the grading factor is . . .	Then use . . .
Normal	Optimum portion size
Severe	Minimum portion size or more **(do not use less)**

Values in this table represent a range of recommended portions.

Representative portion of soybeans for grading, grams

Grading factor	Minimum	Optimum	Export
Colour	working sample	working sample	working sample
Damage	50	250	250
Downy mildew	nil	250	250
Ergot	working sample	working sample	working sample
Excreta	working sample	working sample	working sample
Fireburnt	working sample	working sample	working sample
Foreign material	100	500	500
Heated, mouldy, rancid	50	500	working sample
Immature	50	250	250
Odour	working sample	working sample	working sample
Sclerotinia sclerotiorum	100	working sample	working sample
Soft earth pellets	100	500	working sample
Splits, seed coats	100	500	500
Stained, mottled	working sample	working sample	working sample
Stones	500	500	working sample

Grading factors

Colour (CLR)

Soybeans may be yellow, green, brown or black. Colour is part of the grade name; for example, *Soybeans, No. 1 Canada Yellow*.

Bicoloured or mixed soybeans

- Mixed soybeans are samples containing bicoloured soybeans or soybeans of another colour.
- Bicoloured soybeans are yellow or green soybeans with black or brown pigmented streaks or blotches in the seed coats.

Representative portion for analysis

Minimum	Optimum	Export
Minimum—working sample	Optimum—working sample	Export—working sample

---

Contaminated grain

▲ **Important:** Wear gloves and a mask to handle any sample that is suspected of containing contaminated grain.

Contaminated is defined in the *"Canada Grain Act"* as; "Contaminated means, in respect of grain, containing any substance in sufficient quantity that the grain is unfit for consumption by persons or animals or is adulterated within the meaning of the regulations made pursuant to sections B.01.046(1), B.15.001 and B.15.002(1) of the *Food and Drugs Act*."

Samples deemed to be contaminated by the Grain Research Laboratory in consultation with the Chief Grain Inspector for Canada are graded *Soybeans, Sample Condemned.*

Damage (DMG)

Damaged soybeans include those which are sprouted, frost-damaged, shriveled, ground-damaged, insect damaged, immature, or otherwise unsound.

Representative portion for analysis

Minimum	Optimum	Export
Minimum—50 g	Optimum—250 g	Export—250 g

Downy mildew (DWNY MIL)

Downy mildew is a superficial coating of downy or powdery fungal growth. An individual soybean is considered affected only if all of the fungal growth could be pulled together and the growth covers 50% or more of the surface area of the soybean.

Representative portion for analysis

Minimum	Optimum	Export
Minimum—nil	Optimum—250 g	Export—250 g

Earth pellets

- Hard earth pellets are pellets that do not crumble under light pressure.
  See *Stones.*
- Soft earth pellets are pellets that crumble under light pressure.
  See *Soft earth pellets.*

Ergot (ERG)

Ergot is a plant disease producing elongated fungus bodies with a purplish-black exterior, a purplish-white to off white interior, and a relatively smooth surface texture. Ergot is toxic.

Ergot attacks cereal crops and is not usally present in soybeans, which are a broadleaf crop.

Representative portion for analysis

Minimum—working sample	Optimum—working sample	Export—working sample

Excreta (EXCR)

▲ **Important:** Wear gloves and a mask to handle any samples that you suspect may contain excreta.

Representative portion for analysis

Minimum—working sample	Optimum—working sample	Export—working sample

Fertilizer pellets (FERT PLTS)

Fertilizer pellets are typically either small, round and white or irregular shaped and pink or red. Fertilizer pellets are not considered a hazardous substance however there is no visible means of assuring that material resembling fertilizer pellets is not some other contaminant.

Representative portion for analysis

Minimum—working sample	Optimum—working sample	Export—working sample

Procedures

- Handpick any fertilizer pellets and determine the concentration basis the net working sample.
- Fertilizer pellets are assessed as stones when the concentration does not exceed 1.0% of the net sample weight.
- Samples containing fertilizer pellets in excess of 1.0% of the net sample weight are graded *Soybeans, Held IP Suspect Contaminated Grain.*

Note: Canadian Grain Commission personnel should refer to ISO national work instruction "*Suspect Contaminated Grain, Handling Procedures*" for procedures to be followed when handling samples containing fertilizer pellets.

Fireburnt (FBNT)

Fireburnt soybeans are seeds charred or scorched by fire. A cross-section of a fireburnt seed resembles charcoal with numerous air holes. The air holes result in a low weight seed which crumbles easily under pressure.

Representative portion for analysis

Minimum—working sample
Optimum—working sample
Export—working sample

Procedure

Samples of soybeans containing fireburnt seeds are graded as *Soybeans, Sample Canada Account Fireburnt.*

Foreign material (FM)

Foreign material includes any material other than whole soybeans or split soybeans left in the sample after the removal of dockage.

Representative portion for analysis

Minimum—100 g
Optimum—500 g
Export—500 g

Foreign material other than grain (FMXGRN)

Foreign material other than grain does not include ergot or stones, but does include

- Large weed seeds that did not pass through the No. 8 round-hole sieve
- Soft earth pellets which crumble under light pressure
- Soft fertilizer pellets
- Any other non-toxic material of a similar consistency
- Sclerotinia

Representative portion for analysis

Minimum—100 g
Optimum—500 g
Export—500 g

Frost (FR)

Frost-damaged soybeans, when cut in cross-section, are

- Soybeans whose cotyledons are green or greenish-brown with a glassy wax-like appearance are considered frost-damaged.
- Seeds that are yellow or very pale green are considered sound, even if they are superficially affected by weathering.

Representative portion for analysis

Minimum—50 g
Optimum—500 g
Export—500 g

Heated (HTD)

- Soybeans with a light to dark brown cotyledon when cut in cross section are considered heated.
- Soybeans with a very light tan cotyledon when cut in cross section are considered damaged. See *Damage*.
- Soybeans with light pink seed coats are considered in the overall assessment of colour.

Representative portion for analysis

Minimum—50 g Optimum—500 g Export—working Sample

Hulls (HULLS)

See *Seed coats.*

Immature (IM)

Immature damaged soybeans are characterized by a green exterior appearance in conjunction with any green discolouration of the cotyledon. Examination of the cotyledons is determined by cutting the soybeans in cross section. For grading purposes, immature damaged soybeans are considered as part of the "Total Damage" grade specification.

Soybeans that are green in appearance and have no discolouration of the cotyledon are to be assessed against the overall colour of the sample.

Representative portion for analysis

Minimum—50 g Optimum—250 g Export—250 g

Mottled kernels

See *Stained and mottled.*

Mouldy (MLDY)

Mouldy soybeans are wrinkled and misshapen, and range in colour from medium to dark brown. Large areas of the affected bean are superficially covered with a grey mould. Mouldy beans often have a spongy texture and usually give off an unpleasant odour. They are included in the tolerance for *Heated.*

Representative portion for analysis

Minimum—50 g Optimum—500 g Export—working sample

Mudball soybean

A soybean completely covered with caked-on mud is considered damaged.

Representative portion for analysis

Minimum—100 g Optimum—500 g Export—500 g

Odour (ODOR)

There is no numeric tolerance for odour. Consider

- The basic quality of the sample
- The type and degree of the odour
- The presence of visible residue causing the odour

Grains grading No. 1 through 3 must have a natural odour. A sample would have to grade No. 4 for Damage before it could have a slight odour associated with low quality soybeans.

Representative portion for analysis

Minimum—working sample	Optimum—working sample	Export—working sample

If odour is the grade determinant and there is . . .	Then the grade is . . .
If there is a distinct unnatural or objectionable odour not associated with the quality of the grain, but not heated or fireburnt	*Soybean, Sample Canada (colour) Account Odour*
A heated odour	*Soybean, Sample Canada (colour), Heated*
A fireburnt odour	*Soybean, Sample Canada (colour), Fireburnt*

Other grains (OGS)

All grains other than soybeans that remain in the sample after cleaning are considered other grains.

Representative portion for analysis

Minimum—100 g	Optimum—500 g	Export—500 g

Pokeweed stain

Pokeweed stain is a bright red staining of the soybean seed coat caused by the sap of the pokeweed berry. In some cases, the staining may appear similar to pesticide treated seeds of soybeans.

▲ **Important:** Do not confuse pokeweed stain with pesticide treated seed or contaminated grain.

Rancid

Soybeans in various stages of rancidity are characterized by a deep pink discolouration on the seed coat and varying degrees of discolouration of the cotyledon.

Seeds having a deep pink discolouration on the seed coat are cut and, based upon the extent of discolouration of the cotyledon, assessed as follows:

Discolouration of cotyledon	Assess as
No discolouration of cotyledon to slight discolouration just below seed coat.	Considered in the evaluation of colour.
Pink discolouration of cotyledon greater than just below the seed coat level but not throughout the entire seed.	Considered as *Damage.*
Pink discolouration extends throughout cotyledon.	Considered rancid and included in tolerance for *Heated.*

Representative portion for analysis

Minimum—50 g	Optimum—500 g	Export—working sample

Sclerotinia sclerotiorum (SCL)

Sclerotinia sclerotiorum is a fungus producing hard masses of fungal tissue, called *sclerotia*. The sclerotia vary in size and shape, have a course surface texture, vary in exterior color from dark black to gray to white and have a pure white interior. Sclerotinia is included in *Foreign material other than grain* for grade determination.

Representative portion for analysis

Minimum—100 g	Optimum—working sample	Export—working sample

Seed coats

- In unprocessed samples, loose seed coats are assessed as dockage.
- In commercially clean samples, loose seed coats are assessed as *Splits.*

Shrivelled

If the soybean is shrivelled, small and flat, it has no oil value and is considered *Damaged.*

Representative portion for analysis

Minimum—100 g	Optimum—500 g	Export—500 g

Soft earth pellets (SEP)

Soft earth pellets are pellets that crumble under light pressure—if they do not crumble, they are considered stones. These pellets can be

- Earth and fertilizer pellets
- Any non-toxic material of similar consistency

Representative portion for analysis

Minimum—100 g
Optimum—500 g
Export—working sample

Procedure

- Earth pellets may be removed as dockage. See *Normal cleaning procedures*.
- If soft earth pellets are over 10.0% of the gross weight of the sample, they become a grading factor, included in the tolerance for *Foreign material other than grain*.

1. Return the pellets to the sample.
2. Handpick soft earth pellets from a representative portion of the cleaned sample.
3. If soft earth pellets are the grade determinant, grade the sample *Soybeans, Sample Canada (colour, Account Admixture*.

Splits (SPLT)

Splits include split soybeans, broken seeds that are less than three-quarters of the whole seed, and cotyledons that are loosely held together by the seed coat.

Representative portion for analysis

Minimum—100 g
Optimum—500 g
Export—500 g

Procedure

1. Any slotted hand sieve may be used to help separate splits from the sample.
2. Handpick any small whole soybeans that pass through the sieve and return them to the sample.
3. Handpick the remaining splits in the sample and add them to those removed by sieving.
4. Determine the total percentage by weight of splits.

Sprouted

If a soybean shows evidence of sprouting, it is *Damaged*.

Representative portion for analysis

Minimum—100 g
Optimum—500 g
Export—500 g

Stained and mottled (STND)

Staining or mottling on the surface is caused by weather, dirt, weed stain, or disease. If the soybeans are not damaged or discoloured internally, they are considered sound. See *Pokeweed stain.*

Limits are visible in the Canada standard samples, and are defined under standard of quality as

Good natural colour	Canada No. 1
Slightly stained	Canada No. 2
Stained	Canada No. 3
Badly stained	Canada No. 4 or 5

Representative portion for analysis

Minimum—working sample	Optimum—working sample	Export—working sample

Procedure

Evaluate the stain or mottling according to its effect on the general appearance of the sample.

Stones (STNS)

Stones are hard shale, coal, hard earth pellets, and any other non toxic materials of similar consistency. Fertilizer pellets are assessed as stones when constituting 1.0% or less of the net sample weight. (See *Fertilizer pellets* for specific procedures to be followed when samples contain fertilizer pellets.)

Representative portion for analysis

Minimum—500 g	Optimum—500 g	Export—working sample

Procedures

1. Handpick stones from a representative portion of the cleaned sample.
2. Determine stone concentration in the net sample.

- In western Canada samples of grain containing stones in excess of "basic grade" tolerances, up to 2.5% are graded *Soybeans, Rejected "basic grade" Account Stones.* The "*basic grade*" refers to a grade established in the Canada Grain Regulations (grades listed in the first column in grade determinant tables) that would have been assigned to the sample if it contained no stones.
- In eastern Canada samples of grain containing stones in excess of grade tolerances are degraded to lower grades. Samples containing stones in excess of the tolerance of the lowest grade established by regulation up to 2.5% are graded *Soybeans, Sample Canada (colour) Account Stones.*
- In western and eastern Canada grain containing more than 2.5% stones is graded *Soybeans, Sample Salvage.*

Examples: Western Canada

Excerpt from grade determinant tables for
Soybeans, Canada

Grade name	Stones
No. 1 Canada	Nil
No. 2 Canada	1K
No. 3 Canada	3K
No. 4 Canada	3K
No. 5 Canada	3K

K Number of kernel-sized pieces in 500 g

Basic grade:......................... *Soybeans, No. 2 Canada Yellow*
Reason for basic grade:....... 0.2% Heated

If the above sample contained	Grade in Western Canada
2K stones	*Soybeans, Rejected No. 2 Canada Yellow*
10K stones	*Soybeans, Rejected No. 2 Canada Yellow*
3.0% stones	*Soybeans, Sample Salvage*

Examples: Eastern Canada

Excerpt from grade determinant tables for
Soybeans, Canada

Grade name	Stones
No. 1 Canada	Nil
No. 2 Canada	1K
No. 3 Canada	3K
No. 4 Canada	3K
No. 5 Canada	3K

K Number of kernel-sized pieces in 500 g

Basic grade:......................... *Soybeans, No. 2 Canada Yellow*
Reason for basic grade:....... 0.2% Heated

If the above sample contained	Grade in Eastern Canada
0.08% stones	*Soybeans, No. 3 Canada Yellow*
1.0% stones	*Soybeans, Sample Canada Yellow Account Stones*
3.0% stones	*Soybeans, Sample Salvage*

Treated seed and other chemical substances

Treated seed

Treated seed is grain that has been coated with an agricultural chemical for agronomic purposes. These seed dressings contain a dye to render the treated seed visually conspicuous. The colour of the dye varies depending upon the type of treatment and the type of grain. The current Canadian colour standards for pesticide seed treatments are: cereals–pink or red, canola–baby blue or green. Seed treated with an inoculant may have a green stain. The coatings or stains may appear greasy or powdery and surface area distribution ranges from tiny flecks to complete coverage.

Other chemical substances

Other chemical substances refers to any chemical residues either adhering to the kernel or remaining in the sample and to samples having a chemical odour of any kind.

▲ **Important:** Wear gloves and a mask to handle any samples that you suspect may contain contaminated grain.

Representative portion for analysis

Minimum—working sample	Optimum—working sample	Export—working sample

If a sample is suspected of being coated with a pesticide, desiccant, inoculant or if the sample contains evidence of any foreign chemical substance other than fertilizer pellets, the sample shall be graded *Soybeans, Held IP Suspect Contaminated Grain*.

Note: Canadian Grain Commission personnel should refer to ISO national work instruction "*Suspect Contaminated Grain, Handling Procedures*" for specific procedures to be followed when handling samples suspected of containing treated seed or other chemical substances.

▲ **Important:** Do not confuse pesticide treated seed with pokeweed stain, which is similar.

Uniform in size

Samples are considered to be uniform in size when there is no distinct difference in seed size. Use the Standard sample as a guide to determine uniformity.

Representative portion for analysis

Minimum—working sample	Optimum—working sample	Export—working sample

Variety

Soybeans are graded without reference to variety.

Special analyses

Upon request, samples may be analyzed for other factors. The shipper of the soybeans indicates which factors are to be analyzed and which sieves to use.

Hilum colour (white hilum)

Hilum colour is not a grading factor.

Handpick a representative portion of not less than 100 g of the cleaned sample to determine the percentage by weight of Hilum colour.

Sizing

Analyse a representative portion of not less than 500 g of the cleaned sample. The shipper specifies the sieve size.

Primary and export grade determinants tables

Soybeans, Canada Yellow, Green, Brown, Black or Mixed (CAN)

Grade name	Standard of quality	
	Minimum test weight kg/hL (g/0.5 L)	Degree of soundness
No. 1 Canada	70 (357)	Cool, natural odour, uniform in size, good natural colour
No. 2 Canada	68 (347)	Cool, natural odour, may be slightly stained
No. 3 Canada	66 (337)	Cool, natural odour; may be stained
No. 4 Canada	63 (322)	Cool, may be badly stained
No. 5 Canada	59 (301)	Cool, may be badly stained
Grade, if No. 5 specs not met	*Soybeans, Sample Canada (colour) Account Light Weight*	

Note: The colour is added to the grade name.

Soybeans, Canada Yellow, Green, Brown, Black or Mixed (CAN), continued

Grade name	Damage		Downy mildew	Other colours or bicoloured other than for mixed soybeans	Foreign material				Splits %
	Heat-damaged or moldy %	Total %			Ergot %	Stones %	Foreign material other than grain %	Total %	
No. 1 Canada	Nil	2.0	1.0	2	0.01	Nil	0.1	1.0	10
No. 2 Canada	0.2	3	10	3	**0.025**	1K	0.3	2	15
No. 3 Canada	1.0	5	No limit	5	0.1	3K	0.5	3	20
No. 4 Canada	3	8	No limit	10	**0.25**	3K	2	5	30
No. 5 Canada	5	15	No limit	15	**0.25**	3K	3	8	40
Grade, if No. 5 specs not met	*Soybeans, Sample Canada (colour) Account Heated or Mouldy*	*Soybeans, Sample Canada (colour) Account Damaged*		Appropriate mixed grade	*Soybeans, Sample Canada (colour) Account Ergot*	2.5% or less—*Soybeans, Rejected (grade) Account Stones*, or *Soybeans, Sample Canada (colour) Account Stones* Over 2.5%—*Soybeans, Sample Salvage*	*Soybeans, Sample Canada (colour) Account Admixture*	*Soybeans, Sample Canada (colour) Account Admixture*	*Soybeans, Sample Canada (colour) Account Splits*

K Number of kernel-sized pieces in 500 g

Note: The colour is added to the grade name.

Export shipments

Shipments can be commercially clean or not commercially clean.

Commercially clean

No dockage is assessed on commercially clean shipments.

Samples are considered commercially clean when the sample contains 0.2% or less by weight of pods, stems, or coarse vegetable matter, including 0.1% or less of material other than whole or broken soybeans that passes through the No. 8 round-hole sieve.

In addition, in samples of commercially clean shipments, the amount of finely broken soybeans that passes through a No. 8 round-hole sieve

- On shipments not for direct export, can be up to 0.75% by weight
- On shipments for direct export, can be up to 1.0% by weight

Not commercially clean (NCC)

Shipments which, do not meet the definition of commercially clean, are considered not commercially clean and are allowed only with the permission of the CGC. Dockage is reported to the nearest

- 0.1% for samples representing commercially clean shipments loaded from a single terminal or transfer elevator
- 0.01% for composite samples representing shipments loaded from more than one terminal or transfer elevator

less a deduction of up to 0.2% to take into account the buildup of attritional material.

Grading

Soybeans on export are graded in accordance with primary grade standards and specifications.

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Determination of dockage

Definitions

Dockage is assessed and recorded to the nearest 0.1%.

Dockage is defined under the Canada Grain Act as "any material intermixed with a parcel of grain, other than kernels of grain of a standard of quality fixed by or under this Act for a grade of that grain, that must and can be separated from the parcel of grain before that grade can be assigned to the grain." Dockage is removed by following the cleaning procedures described in this section of the guide.

The sample as it arrives is referred to as the uncleaned or dirty sample. Its weight is the **gross weight** of the sample. Dockage is assessed on the gross weight of the sample.

Dockage not reported

▲ **Important:** Dockage is not reported for samples graded

- *Fababeans, Sample Canada Account Fireburnt*
- *Fababeans, Sample Salvage*
- *Fababeans, Sample Condemned*

Normal cleaning procedures

▲ **Important:** Wear gloves and a mask to handle any samples that you suspect may contain hazardous substances.

1. Using a Boerner-type divider, divide the uncleaned sample to obtain a representative portion.
    - Official samples should be at least 900 grams.
    - Unofficial samples should be at least 750 grams.
2. Choose the appropriate hand sieve for the size of fababean.

    No. 8 slotted
    No. 9 slotted
    No. 11 slotted
3. Sieve the samples over the appropriate slotted sieve, using approximately 250 g at a time, to remove all readily removable material.
4. Determine dockage, using the list under *Composition of dockage*.

Composition of dockage

- Material handpicked from the sieved sample, including all coarse foreign vegetable matter such as pods, stems, straw, and thistle tops
- All material removed by sieving

    ▲ **Important:** Do not handpick mineral matter, ergot, sclerotinia, or large-seeded grains other than fababeans from the sieved sample.

- Soft earth pellets, if they are 10.0% or less of the uncleaned sample by weight

Optional analysis

Where a shipper requests special cleaning of a carlot of grain at a terminal or transfer elevator, and the elevator manager agrees, dockage material will be analyzed for the presence of grain. The percentage and grade of any grain contained in the dockage will be reported and elevator stocks will be adjusted on the basis of the analysis. Agreement of the shipper and unload elevator must be conveyed to the CGC in writing prior to the analysis being performed.

Procedures

1. Analyze the official sample.
2. Record the following on inspection records:
    - The percentage by gross weight to the nearest 0.1% and the grade of fababeans.
    - The percentage by gross weight to the nearest 0.1% and the grade of grain separable from dockage.
    - The percentage of dockage.

    Example
    95.0% Fababeans, No. 1 CAN
    4.0% Domestic Mustard Seed, No. 1 CAN Oriental
    1.0% dockage

Grading

Important definitions

Net weight of sample

The sample after cleaning and removal of dockage is referred to as the cleaned sample. Its weight is the net weight of the sample. Percentages by weight for grading refer to percentages of the net weight.

Kernel counts (K)

A kernel count is the number of kernel-sized pieces of a foreign material in 500 g of cleaned sample.

- To do kernel counts, you must have 500 grams of cleaned sample.
- All grading is done on representative portions divided down from the cleaned sample using a Boerner-type divider.

Hazardous substances in samples

Wear gloves and a mask to handle any samples that you suspect may contain hazardous substances. Hazardous substances are defined in the Regulations as "any pesticide, herbicide or desiccant."

Representative portions for grading

All grading is done on representative portions divided down from the cleaned sample, using a Boerner-type divider.

When the grading factor is . . .	Then use . . .
Normal	Optimum portion size
Severe	Minimum portion size or more **(do not use less)**

Values in the following table represent a range of recommended portions.

Representative portion of fababeans for grading, grams

Grading factor	Minimum	Optimum	Export
Damage	100	**250**	250
Excreta	working sample	**working sample**	working sample
Fireburnt	500	**working sample**	working sample
Foreign material	100	**500**	500
Heated or rotted	100	**250**	500
Insect parts	working sample	**working sample**	working sample
Mouldy	100	**250**	500
Odour	working sample	**working sample**	working sample
Perforated	100	**250**	250
Sclerotinia	250	**1000**	1000
Splits	100	**250**	500
Stones	250	**500**	1000

Grading factors

Blackened

Fababeans are blackened when their seed coats are very dark blue to black. See *Damage*.

Representative portion for analysis

Minimum—100 g	Optimum—250 g	Export—250 g

Colour (CLR)

Colour is evaluated on the cleaned sample after the removal of damaged and split fababeans.

Terms used to describe colour in the grade determinants tables

Term	Characteristics
Reasonably good natural colour	Fababeans are moderately immature, with lightly adhered soil, moderately discoloured from storage or other natural causes, such as mottling.
Fair colour	Fababeans are immature but not green, have moderate amounts of adhered soil, or are otherwise moderately discoloured from natural causes, such as mottling.
Poor colour	Fababeans have a dark discolouration covering less than half of the hull, where there is no penetration of the cotyledon.

Other terms used to describe colour

Term	Characteristics
Sunburned or oxidation	Fababeans have undergone normal discolouration of the seed coats during storage. The colour varies from light tan to brown to very dark brown, depending on the duration and conditions of storage.
Immature	Fababeans are normal size and greenish, but not distinctly green.

Contaminated grain

▲ **Important:** Wear gloves and a mask to handle any sample that is suspected of containing contaminated grain.

Contaminated is defined in the *"Canada Grain Act"* as; "Contaminated means, in respect of grain, containing any substance in sufficient quantity that the grain is unfit for consumption by persons or animals or is adulterated within the meaning of the regulations made pursuant to sections B.01.046(1), B.15.001 and B.15.002(1) of the *Food and Drugs Act*."

Samples deemed to be contaminated by the Grain Research Laboratory in consultation with the Chief Grain Inspector for Canada are graded *Fababeans, Sample Condemned*.

Cracked (CRKD)

Fababeans with a discoloured exposed cotyledon are considered cracked. See *Damage*.

Representative portion for analysis

Minimum—100 g Optimum—250 g Export—250 g

Cracked seed coats (CSDC)

Fababeans with cracked seed coats are considered sound if the halves of the kernels are held firmly together and the beans are not otherwise damaged.

Representative portion for analysis

Minimum—100 g Optimum—250 g Export—250 g

Damage (DMG)

Damage includes

- Blackened or cracked
- Sprouting
- Distinct immaturity
- Distinct deterioration or discolouration by weather or disease
- Insect damage
- Heat or mould damage
- Any other damage that seriously affects appearance or quality

Representative portion for analysis

Minimum—100 g Optimum—250 g Export—250 g

Discoloured (DCLR)

Fababeans are considered discoloured if the discolouration on the seed coat covers more than half the bean or when the discolouration penetrates the cotyledon. See *Damage*.

Representative portion for analysis

Minimum—100 g Optimum—250 g Export—250 g

Procedures

If the penetration of the discolouration is not obvious, cut the cotyledon crosswise in the discoloured area to determine the extent of the discolouration.

Earth pellets

- Hard earth pellets are pellets that do not crumble under light pressure.
  See *Stones*.
- Soft earth pellets are pellets that crumble under light pressure.
  See *Soft earth pellets*.

Ergot (ERG)

Ergot is a plant disease producing elongated fungus bodies with a purplish-black exterior, a purplish-white to off white interior, and a relatively smooth surface texture.

Representative portion for analysis

Minimum—500 g Optimum—1000 g Export—1000 g

Excreta (EXCR)

▲ **Important:** Wear gloves and a mask to handle any samples that you suspect may contain excreta.

There is no tolerance for excreta in fababeans.

Representative portion for analysis

Minimum—working sample Optimum—working sample Export—working sample

Fertilizer pellets (FERT PLTS)

Fertilizer pellets are typically either small, round and white or irregular shaped and pink or red. Fertilizer pellets are not considered a hazardous substance however there is no visible means of assuring that material resembling fertilizer pellets is not some other contaminant.

Representative portion for analysis

Minimum—working sample Optimum—working sample Export—working sample

Procedures

- Handpick any fertilizer pellets and determine the concentration basis the net working sample.
- Fertilizer pellets are assessed as stones when the concentration does not exceed 1.0% of the net sample weight.
- Samples containing fertilizer pellets in excess of 1.0% of the net sample weight are graded *Fababeans, Held IP Suspect Contaminated Grain.*

Note: Canadian Grain Commission personnel should refer to ISO national work instruction "*Suspect Contaminated Grain, Handling Procedures*" for procedures to be followed when handling samples containing fertilizer pellets.

Fireburnt (FBNT)

Fireburnt fababeans are beans charred or scorched by fire. A cross-section of a fireburnt bean resembles charcoal with numerous air holes. The air holes result in a low weight bean which crumbles easily under pressure.

Representative portion for analysis

Minimum—500 g	Optimum—working sample	Export—working sample

Procedures

Samples containing any fireburnt seeds are graded *Fababeans, Sample Canada Account Fireburnt.*

Foreign material (FM)

Foreign material is any material other than whole or split fababeans.

Representative portion for analysis

Minimum—100 g	Optimum—500 g	Export—500 g

Green (GR)

Fababeans that are distinctly green from immaturity are considered damaged. See *Damage.*

Representative portion for analysis

Minimum—100 g	Optimum—250 g	Export—250 g

Heated (HTD)

Fababeans are considered heated or rotted if they are materially discoloured as a result of heating or rotting. Seed coats appear dark brown to black. The cotyledon tissue of dissected beans appears tan or brown. See *Damage.*

Representative portion for analysis

Minimum—100 g	Optimum—250 g	Export—500 g

Insect parts (I PARTS)

Insect parts refers to pieces of insects such as grasshoppers and lady bugs that remain in the sample after cleaning or processing. Samples are analyzed for the percentage of insect fragments and graded according to established tolerances.

If pulse crops come into contact with insects during the harvesting process, it may result in seed staining and earth adhering to the seed and may result in samples having an objectionable odour. Samples containing staining of this nature will be considered to be earth tagged and graded according to colour definitions. Samples having a distinct objectionable odour not associated with the quality of the grain will be graded *Type of Grain* Sample Account Odour.

Representative portion for analysis

Minimum—working sample	Optimum—working sample	Export—working sample

Mouldy (MLDY)

Fababeans are considered mouldy if they show clear evidence of mildew or mould.

Representative portion for analysis

Minimum—100 g Optimum—250 g Export—500 g

Odour (ODOR)

There is no numeric tolerance for odour. Consider

- The basic quality of the sample
- The type and degree of the odour
- The presence of visible residue causing the odour

Representative portion for analysis

Minimum—working sample Optimum—working sample Export—working sample

If odour is the grade determinant and there is . . .	Then the grade is . . .
An exessive objectionable odour not associated with the quality of the grain, but not heated or fireburnt	*Fababeans, Sample CW/CE Account Odour*
An exessive heated odour	*Fababeans, Sample CW/CE Account Heated*
An exessive fireburnt odour	*Fababeans, Sample CW/CE Account Fireburnt*

Perforated (PERF)

Fababeans are considered perforated if they show clear evidence of hull perforations caused by insects or disease.

Representative portion for analysis

Minimum—100 g Optimum—250 g Export—250 g

Rime

White rime is the adhered lining of the seed pod.

- Fababeans that are completely and densely covered with white rime are considered damaged. See *Damage.*
- When the rime is sparse enough to expose the soundness of the bean, the bean is sound and the rime is considered in the general appearance of the sample.

Representative portion for analysis

Minimum—100 g Optimum—250 g Export—250 g

Rotted (ROT)

See *Heated.*

Sclerotinia sclerotiorum (SCL)

Sclerotinia sclerotiorum is a fungus producing hard masses of fungal tissue, called *sclerotia*. The sclerotia vary in size and shape, have a course surface texture, vary in exterior color from dark black to gray to white and have a pure white interior.

Representative portion for analysis

Minimum—250 g	Optimum—1000 g	Export—1000 g

Soft earth pellets (SEP)

Soft earth pellets are pellets that crumble under light pressure—if they do not crumble, they are considered stones. These pellets can be

- Earth and fertilizer pellets
- Any non-toxic material of similar consistency

Representative portion for analysis

Minimum—100 g	Optimum—500 g	Export—500 g

Procedures

- Earth pellets may be removed as dockage. See *Normal cleaning procedures.*
- If soft earth pellets are over 10.0% of the gross weight of the sample, they become a grading factor, included in the tolerance for *Foreign Material.*

1. Return the pellets to the sample.
2. Handpick soft earth pellets from a representative portion of the cleaned sample.
3. If soft earth pellets are the grade determinant, grade the sample *Fababeans, Sample Canada Account Admixture*.

Splits (SPLT)

Splits include

- Halves or smaller pieces of fababeans
- Halves that are loosely held together by cracked seed coats
- Fababeans with cracked cotyledons, such as from artificial drying

Splits do not include fababeans that are otherwise damaged.

Representative portion for analysis

Minimum—100 g	Optimum—250 g	Export—500 g

Sprouted (SPTD)

Fababeans in which the hull is parted over the area of the germ as a result of sprouting are considered damaged. See *Damage.*

Representative portion for analysis

Minimum—100 g	Optimum—250 g	Export—250 g

Stones (STNS)

Stones are hard shale, coal, hard earth pellets, and any other non toxic materials of similar consistency. Fertilizer pellets are assessed as stones when constituting 1.0% or less of the net sample weight. (See *Fertilizer pellets* for specific procedures to be followed when samples contain fertilizer pellets.)

Representative portion for analysis

Minimum—250 g	Optimum—500 g	Export—1000 g

Procedures

1. Handpick stones from a representative portion of the cleaned sample.
2. Determine stone concentration in the net sample.

- In western Canada samples of grain containing stones in excess of "basic grade" tolerances, up to 2.5% are graded *Fababeans, Rejected "basic grade" Account Stones*. The "*basic grade*" refers to a grade established in the Canada Grain Regulations (grades listed in the first column in grade determinant tables) that would have been assigned to the sample if it contained no stones.
- In eastern Canada samples of grain containing stones in excess of grade tolerances are degraded to lower grades. Samples containing stones in excess of the tolerance of the lowest grade established by regulation up to 2.5% are graded *Fababeans, Sample Canada Account Stones.*
- In western and eastern Canada grain containing more than 2.5% stones is graded *Fababeans, Sample Salvage.*

Examples: Western Canada

Excerpt from grade determinant tables for
Fababeans, Canada

Grade name	Stones %
No. 1 Canada	0.1
No. 2 Canada	0.2
No. 3 Canada	0.5

Basic grade:......................... *Fababeans, No. 2 Canada*
Reason for basic grade:....... 2.0% Damage

If the above sample contained	Grade in western Canada
0.4% stones	*Fababeans, Rejected No. 2 Canada Account Stones*
1.0% stones	*Fababeans, Rejected No. 2 Canada Account Stones*
3.0% stones	*Fababeans, Sample Salvage*

Examples: Eastern Canada

Excerpt from grade determinant tables for
Fababeans, Canada

Grade name	Stones %
No. 1 Canada	0.1
No. 2 Canada	0.2
No. 3 Canada	0.5

Basic grade:......................... *Fababeans, No. 2 Canada*
Reason for basic grade:....... 2.0% Damage

If the above sample contained	Grade in eastern Canada
0.4% stones	*Fababeans, No. 3 Canada*
1.0% stones	*Fababeans, Sample Canada Account Stones*
3.0% stones	*Fababeans, Sample Salvage*

Treated seed and other chemical substances

Treated seed

Treated seed is grain that has been coated with an agricultural chemical for agronomic purposes. These seed dressings contain a dye to render the treated seed visually conspicuous. The colour of the dye varies depending upon the type of treatment and the type of grain. The current Canadian colour standards for pesticide seed treatments are: cereals–pink or red, canola–baby blue or green. Seed treated with an inoculant may have a green stain. The coatings or stains may appear greasy or powdery and surface area distribution ranges from tiny flecks to complete coverage.

Other chemical substances

Other chemical substances refers to any chemical residues either adhering to the kernel or remaining in the sample and to samples having a chemical odour of any kind.

▲ **Important:** Wear gloves and a mask to handle any samples that you suspect may contain contaminated grain.

Representative portion for analysis

Minimum	Optimum	Export
working sample	working sample	working sample

If a sample is suspected of being coated with a pesticide, desiccant, inoculant or if the sample contains evidence of any foreign chemical substance other than fertilizer pellets, the sample shall be graded *Fababeans, Held IP Suspect Contaminated Grain*.

Note: Canadian Grain Commission personnel should refer to ISO national work instruction "*Suspect Contaminated Grain, Handling Procedures*" for specific procedures to be followed when handling samples suspected of containing treated seed or other chemical substances.

Varieties

Fababeans are graded without reference to variety.

Primary and export grade determinants tables

Fababeans, Canada (CAN)

Grade name	Standard of quality	Splits %	Damage				Foreign material				
	Degree of soundness		Heated or rotted %	Mouldy %	Perforated damage %	Total %	Excreta %	Insect parts %	Sclerotinia %	Stones or shale %	Total %
No. 1 Canada	Reasonably well matured, reasonably good natural colour	6	Nil	Nil	1	4	0.01	0.02	0.05	0.1	0.2
No. 2 Canada	Fairly well matured, fair colour	9	3K	6K	3	6	0.01	0.02	0.05	0.2	0.5
No. 3 Canada	Cool and sweet, excluded from higher grades on account of immaturity, poor colour or damage	12	1	2	3	10	0.01	0.02	0.05	0.5	2
Grade, if No. 3 specs not met		*Fababeans, Sample Canada Account Splits*	*Fababeans, Sample Canada Account Heated*	*Fababeans, Sample Canada Account Mouldy Kernels*	*Fababeans, Sample Canada Account Damaged*	*Fababeans, Sample Canada Account Damaged*	*Fababeans, Sample Canada Account Excreta*	*Fababeans, Sample Canada Account Admixture*	*Fababeans, Sample Canada Account Admixture*	2.5% or less—*Fababeans, Rejected (grade) Account Stones*, or *Fababeans, Sample Canada Account Stones* Over 2.5%—*Fababeans, Sample Salvage*	*Fababeans, Sample Canada Account Admixture*

K Number of kernel-sized pieces in 500 g

Export shipments

Shipments can be commercially clean or not commercially clean.

Commercially clean

Dockage is not reported for commercially clean shipments. A deduction for finely broken fababeans removed by the No. 8 slotted sieve as dockage is allowed

- On shipments not for direct export, of up to 0.75%
- On shipments for direct export, of up to 1.0%

Definition of commercial cleanliness, Fababeans

	Foreign material	
Grade name	Material passing through No. 8 slotted sieve, including handpicked material %	Total %
No. 1 Canada	0.1	0.2
No. 2 Canada	0.1	0.2
No. 3 Canada	0.1	0.2

Not commercially clean (NCC)

Shipments that do not meet the standards for commercial cleanliness are referred to as not commercially clean. Such shipments are permitted only with the permission of the CGC.

For samples representing not commercially clean shipments approved by the CGC for shipment from terminal and transfer elevators, dockage is reported to the nearest

- 0.1% for samples representing commercially clean shipments loaded from a single terminal or transfer elevator
- 0.01% for composite samples representing shipments loaded from more than one terminal or transfer elevator

less a direct deduction of up to 0.2% to take into account the buildup of attritional material.

Grading

Where no export standards exist, fababeans on export are graded in accordance with primary grade standards.

22. Chick peas

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Export shipments **22-11**

Determination of dockage

Definitions

Dockage is assessed and recorded to the nearest 0.1%.

Dockage is defined under the Canada Grain Act as "any material intermixed with a parcel of grain, other than kernels of grain of a standard of quality fixed by or under this Act for a grade of that grain, that must and can be separated from the parcel of grain before that grade can be assigned to the grain." Dockage is removed by following the cleaning procedures described in this section of the guide.

The sample as it arrives is referred to as the uncleaned or dirty sample. Its weight is the gross weight of the sample. Dockage is assessed on the gross weight of the sample.

Dockage not reported

▲ **Important:** Dockage is not reported for samples grading

- *Chick Peas, Sample CW (class) Account Fireburnt*
- *Chick Peas, Sample Salvage*
- *Chick Peas, Sample Condemned*

Normal cleaning procedures

▲ **Important:** Wear gloves and a mask to handle any samples that you suspect may contain hazardous substances.

Dockage is assessed only on unprocessed samples of chick peas. All foreign material in processed samples is assessed as grading factors.

1. Using a Boerner-type divider, divide the uncleaned sample to obtain a representative portion.
   - Official samples should be at least 900 grams.
   - Unofficial samples must be at least 750 grams.
2. Choose the appropriate hand sieve for the class of chick peas:
   - **Kabuli:** No. 18 round-hole sieve (large seeded)
     No. 12 slotted sieve (medium seeded)
   - **Desi:** No. 12 slotted sieve
3. Sieve the sample, using approximately 250 grams at a time, over the appropriate sieve to remove all readily removable material.
4. Handpick the portion remaining on top of the sieve to remove all course foreign vegetable matter such as pods, stems, straw, thistle tops.

Composition of dockage

All material removed by seiving or handpicking or both, as defined in *Normal cleaning procedures*.

Optional analysis

Where a shipper requests special cleaning of a carlot of grain at a terminal or transfer elevator, and the elevator manager agrees, dockage material will be analyzed for the presence of grain. The percentage and grade of any grain contained in the dockage will be reported and elevator stocks will be adjusted on the basis of the analysis. Agreement of the shipper and unload elevator must be conveyed to the CGC in writing prior to the analysis being performed.

Procedures

1. Analyze the official sample.
2. Record the following on inspection records:
    - The percentage by gross weight to the nearest 0.1% and the grade of chick peas.
    - The percentage by gross weight to the nearest 0.1% and the grade of grain separable from dockage.
    - The percentage of dockage.

    Example
    95.0% Chick Peas, No. 1 CW Desi
    4.0% Domestic Mustard Seed, No. 1 CAN Oriental
    1.0% dockage

Sizing

Upon written request, samples of chick peas may be analyzed for size. Sizing procedures are as follows:

Procedures

1. Using a Boener-type divider, divide the clean sample to obtain a representative portion of between 250 – 300 grams.
2. Pour the representative sample onto the left hand side of the hand sieve.
3. Move the sieve from left to right 20 times, using a sifting motion. One time is one complete motion from center, to one side, to the other side and back to the center. The total distance from left to right is 20 cm or about 8 inches.
4. Determine the amount remaining on top of the sieve. Passing your hand along the underside of the sieve may be necessary in order to dislodge all the seeds.
5. Report the percent by weight of the seeds remaining on top of the sieve.

    Note: The size of sieve must be clearly indicated on the written request. Generally, sizing would be done using one of the following hand sieves – No. 8, 9 or 10 mm round hole, however, the analysis can be done on any sieve size as requested.

Grading

Important definitions

Net weight of sample

The sample after cleaning and removal of dockage is called the cleaned sample. Its weight is the net weight of the sample. Percentages by weight for grading refer to percentages of the cleaned sample, or the net weight.

Hazardous substances in samples

Wear gloves and a mask to handle any samples that you suspect may contain hazardous substances. Hazardous substances are defined in the Regulations as "any pesticide, herbicide or desiccant."

Representative portion for grading

All grading is done on representative portions divided down from the cleaned sample, using a Boerner-type divider.

When concentration of the grading factor is . . .	Then use . . .
Low	Optimum portion size
High	Minimum portion size or more **(do not use less)**

Values in the table represent a range of recommended portion sizes.

Representative portion of chick peas for grading, grams

Grading factor	Minimum	Optimum	Export
Colour	working sample	working sample	working sample
Damage	50	100	100
Foreign material	100	250	500
Green	50	100	100
Insect parts	working sample	working sample	working sample
Mechanical damage including splits	50	100	100
Odour	working sample	working sample	working sample

Grading factors

Classes

There are two classes of chick peas, Kabuli and Desi. The class forms part of the grade name.

Colour (CLR)

Colour is a grade determinant only in the Kabuli class. Colour is assessed after the removal of damaged chick peas and chick peas assessed as green. See *Damaged* and *Green*.

If chick peas are . . .	Colour is . . .
Sound, well matured and have a uniform normal colour	Good
Immature, but not green, have moderate amounts of adered soil, are lightly stained but otherwise moderately discoloured from natural causes	Fair
Do not meet the definition of fair colour	Poor

Representative portion for analysis

Minimum—working sample	Optimum—working sample	Export—working sample

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Contaminated grain

▲ **Important:** Wear gloves and a mask to handle any sample that is suspected of containing contaminated grain.

Contaminated is defined in the *"Canada Grain Act"* as; "Contaminated means, in respect of grain, containing any substance in sufficient quantity that the grain is unfit for consumption by persons or animals or is adulterated within the meaning of the regulations made pursuant to sections B.01.046(1), B.15.001 and B.15.002(1) of the *Food and Drugs Act*."

Samples deemed to be contaminated by the Grain Research Laboratory in consultation with the Chief Grain Inspector for Canada are graded *Chick Peas, Sample Condemned.*

Damage (DMG)

Damaged chick peas include

- Whole or broken chick peas that are sprouted, frost damaged, heated, damaged by insects, distinctly deteriorated or discoloured by weather or by disease, or that are otherwise damaged in a way that seriously affects their quality.

In Kabuli chick peas, white and shrivelled chick peas and yellow or water stained chick peas should be cut and examined for damage. If the cotyledons show

- Any signs of visible damage, they are considered damaged
- No signs of visible damage, they are considered in the evaluation of colour

Representative portion for analysis

Minimum—50 g	Optimum—100 g	Export—100 g

Earth pellets (EP)

See *Foreign material.*

Ergot (ERG)

See *Foreign material.*

Excreta (EXCR)

6. ▲ **Important:** Wear gloves and a mask to handle any samples that you suspect may contain excreta.

See *Foreign material.*

Fertilizer pellets (FERT PLTS)

Fertilizer pellets are typically either small, round and white or irregular shaped and pink or red. Fertilizer pellets are not considered a hazardous substance however there is no visible means of assuring that material resembling fertilizer pellets is not some other contaminant.

Representative portion for analysis

Minimum—working sample	Optimum—working sample	Export—working sample

Procedures

- Handpick any fertilizer pellets and determine the concentration basis the net working sample.
- Fertilizer pellets are assessed as stones when the concentration does not exceed 1.0% of the net sample weight.
- Samples containing fertilizer pellets in excess of 1.0% of the net sample weight are graded *Chick Peas, Held IP Suspect Contaminated Grain.*

Note: Canadian Grain Commission personnel should refer to ISO national work instruction "*Suspect Contaminated Grain, Handling Procedures*" for procedures to be followed when handling samples containing fertilizer pellets.

Fireburnt (FBNT)

Fireburnt seeds have been charred or scorched by fire. No fireburnt seeds are allowed in chick peas.

Procedure

Samples considered fireburnt are graded *Chick Peas, Sample CW (class) Account Fireburnt.*

Foreign material (FM)

Foreign material includes

- Other classes of chick peas
- Other grains and seeds
- Ergot and sclerotinia
- Mineral matter, stones and earth pellets
- Excreta
- Any other material not removed by *Normal cleaning procedures*

Representative portion for analysis

Minimum—100 g Optimum—250 g Export—500 g

Green (GR)

Chick peas may be considered green regardless of the cause.

Frost-damaged chick peas which are green are considered under the grade determinant for *Green*.

Frost-damaged chick peas with no green colour are considered under the grade determinant for *Damage*.

Kabuli chick peas are considered green if they show any green colour of any size area anywhere on the seeds or seed coats.

Desi chick peas are considered green if they show distinctly green colour throughout the seed when cut to expose the cotyledons.

Representative portion for analysis

Minimum—50 g Optimum—100 g Export—100 g

Heated (HTD)

Chick peas that have dull seed coats and discoloured cotyledons ranging from light tan to dark brown are considered heated. See *Damage*.

Insect damage (I DMG)

See *Damage*.

Insect parts (I PARTS)

Insect parts refers to pieces of insects such as grasshoppers and lady bugs that remain in the sample after cleaning or processing. Samples are analyzed for the percentage of insect fragments and graded according to established tolerances.

If pulse crops come into contact with insects during the harvesting process, it may result in seed staining and earth adhering to the seed and may result in samples having an objectionable odour. Samples containing staining of this nature will be considered to be earth tagged and graded according to colour definitions. Samples having a distinct objectionable odour not associated with the quality of the grain will be graded *Type of Grain* Sample Account Odour.

Representative portion for analysis

Minimum—working sample	Optimum—working sample	Export—working sample

Mechanical damage including splits (MDMGINC- SPLTS)

In chick peas, mechanical damage including splits includes

- Whole chick peas with more than 10% of the chick pea broken off
- Split chick peas

7. ▲ **Important:** Seeds with hairline cracks and chipped seed coats are not considered mechanical damage.

Representative portion for analysis

Minimum—50 g	Optimum—100 g	Export—100 g

Procedures

Chick peas with mechanical damage are hand-picked.

Odour (ODOR)

There is no numeric tolerance for odour. Consider

- The basic quality of the sample
- The type and degree of the odour
- The presence of visible residue causing the odour

Representative portion for analysis

Minimum—working sample	Optimum—working sample	Export—working sample

If odour is the grade determinant and there is . . .	Then the grade is . . .
A distinct objectionable odour not associated with the quality of the grain, but not heated or fireburnt	*Chick Peas, Sample CW (class) Account Odour*
A distinct heated odour	*Chick Peas, Sample CW (class) Account Heated*
A distinct fireburnt odour	*Chick Peas, Sample CW (class) Account Fireburnt*

Sclerotinia sclerotiorum (SCL)

Sclerotinia sclerotiorum is a fungus producing hard masses of fungal tissue, called *sclerotia*. The sclerotia vary in size and shape, have a course surface texture, vary in exterior color from dark black to gray to white and have a pure white interior. See *Foreign material*

Soft earth pellets (SEP)

See *Foreign material.*

Stones (STNS)

See *Foreign material.*

Treated seed and other chemical substances

Treated seed

Treated seed is grain that has been coated with an agricultural chemical for agronomic purposes. These seed dressings contain a dye to render the treated seed visually conspicuous. The colour of the dye varies depending upon the type of treatment and the type of grain. The current Canadian colour standards for pesticide seed treatments are: cereals–pink or red, canola–baby blue or green. Seed treated with an inoculant may have a green stain. The coatings or stains may appear greasy or powdery and surface area distribution ranges from tiny flecks to complete coverage.

Other chemical substances

Other chemical substances refers to any chemical residues either adhering to the kernel or remaining in the sample and to samples having a chemical odour of any kind.

8. ▲ **Important:** Wear gloves and a mask to handle any samples that you suspect may contain contaminated grain.

Representative portion for analysis

Minimum—working sample	Optimum—working sample	Export—working sample

If a sample is suspected of being coated with a pesticide, desiccant, inoculant or if the sample contains evidence of any foreign chemical substance other than fertilizer pellets, the sample shall be graded *Chick Peas, Held IP Suspect Contaminated Grain.*

Note: Canadian Grain Commission personnel should refer to ISO national work instruction "*Suspect Contaminated Grain, Handling Procedures*" for specific procedures to be followed when handling samples suspected of containing treated seed or other chemical substances.

Primary and export grade determinants tables

Chick peas, Canada Western Kabuli (CW)

Grade name	Standard of quality	Damage %	Mechanical damage including splits %	Green %	Foreign material	
	Colour				Insect parts %	Total %
No. 1 CW	Good, natural colour	0.5	1	0.5	0.02	0.10
No. 2 CW	Fair	1	2	1.0	0.02	0.2
No. 3 CW	Poor	2	3	2	0.02	0.2
Grade, if No. 3 specs not met	*Chick Peas, Sample CW Kabuli Account Colour*	*Chick Peas, Sample CW Kabuli Account Damaged*	*Chick Peas, Sample CW Kabuli Account Mechanical Damage and Splits*	*Chick Peas, Sample CW Kabuli Account Green*	*Chick Peas, Sample CW Kabuli Account Foreign Material*	*Chick Peas, Sample CW Kabuli Account Foreign Material*

Chick peas, Canada Western Desi (CW)

Grade name	Damage %	Mechanical damage including splits %	Green %	Foreign material	
				Insect parts %	Total %
No. 1 CW	1	2	1.0	0.02	0.10
No. 2 CW	2	3.5	2.0	0.02	0.2
No. 3 CW	3	5	3	0.02	0.2
Grade, if No. 3 specs not met	*Chick Peas, Sample CW Desi Account Damaged*	*Chick Peas, Sample CW Desi Account Mechanical Damage and Splits*	*Chick Peas, Sample CW Desi Account Green*	*Chick Peas, Sample CW Desi Account Foreign Material*	*Chick Peas, Sample CW Desi Account Foreign Material*

Export shipments

Chick peas on export are graded in accordance with primary grade standards and specifications. Foreign material in cleaned or processed peas is treated as a grading factor and not assessed as dockage. Cargoes containing dockage may not be shipped except with permission from the CGC.

23. Screenings

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Composition of screenings

Screenings consist of dockage material that qualifies only for Class IV grades. Screenings are graded in accordance with the specifications in the *Off-grades of Grain and Grades of Screenings* order.

Show the composition of screenings in detail on all records for carlots and cargoes. The composition determines the market value of the screenings.

Whole grain in screenings

Whole grain in screenings includes wheat, rye, barley, oats, triticale, flaxseed, rapeseed, canola, domestic mustard seed and pulses.

At a terminal, process, or transfer elevator, show the percentage by weight and the grade of whole grain in screenings on all inspection records and grade certificates and as part of the grade name, if

- Shipments contain 6.0% or over by weight of whole grain which can be separated by the usual cleaning methods
- The grain qualifies for an official, special or off-grade

For example,

Grade: *Refuse Screenings, less 15.0% Wheat, CW/CE Feed*	
Composition	10.0% chaff
	15.0% Wheat CW/CE Feed
	8.0% large seeds
	67.0% small seeds and dust
Total	**100.0%**

Report the percentage by weight and the kinds of whole grain in the sample for samples representing shipments from primary elevators or unlicensed warehouses to destinations other than terminal or transfer elevators.

For example,

Grade: *Refuse Screenings, less 15.0% Wheat*	
Composition	10.0% chaff
	15.0% Wheat
	8.0% large seeds
	67.0% small seeds and dust
Total	**100.0%**

Canola, rapeseed or domestic mustard seed in screenings

Record the percentage by weight of whole seeds of small oilseeds, canola, rapeseed or domestic mustard seed, that can be separated from samples of screenings by approved sieves.

Include small, shrivelled or broken seeds which pass through the slotted sieve in the total percentage by weight of small seeds and dust.

Dockage

Dockage is not assessed for screenings except for *Mixed Feed Oats*.

Grading factors

Ergot (ERG)

Ergot is a disease that attacks cereal grains and results in a fungus growth in place of the kernel of grain. The disease produces elongated fungal bodies that have a purplish-black exterior, a purplish-white to off white interior, and a relatively smooth surface texture.

Excreta (EXCR)

▲ **Important:** Wear gloves and a mask to handle any samples that you suspect may contain excreta.

Heated, fireburnt and odour (HTD, FBNT, ODOR)

Screenings that are not sweet are graded according to their composition with the condition included in the grade name.

If odour is the grade determinant and there is . . .	Then the grade is . . .
An excessive objectionable odour not associated with the quality of the grain, but not heated or fireburnt	*Screenings, (Grade Name) Account Odour*
An excessive heated odour	*Screenings, (Grade Name) Account Heated*
An excessive fireburnt odour	*Screenings, (Grade Name) Account Fireburnt*

Injurious seeds

The following seeds are designated by the Feeds Regulations as detrimental to animal health:

bird rape
cockle, purple
false flax, flat-seeded
false flax, western (large seeded)
mustard, Indian
mustard, tumble
mustard, wormseed
cockle, cow
darnel
false flax, small-seeded
mustard, black
mustard, hare's-ear
mustard, wild
stinkweed

Knuckles and straw, (KNKLS STRAW)

Knuckles include empty wheat heads, nodes of stems and short pieces of straw up to approximately 2.5 cm in length.

Mustard seed (MUS)

Common wild mustard and hare's ear mustard seed are designated as injurious in the Canada Feed Regulations.

Other domestic grains

Other domestic grains are any grains other than wheat, rye, barley, oats, triticale, flaxseed, solin, rapeseed, canola, domestic mustard seed and pulses.

Other large seeds (OLSDS)

Other large seeds are seeds not designated as injurious in the Canada Feed Regulations. They include lady's thumb and pale smartweed.

Sclerotinia sclerotiorum (SCL)

Sclerotinia sclerotiorum is a fungus producing hard masses of fungal tissue, called *sclerotia*. The sclerotia vary in size and shape, have a course surface texture, vary in exterior color from dark black to gray to white and have a pure white interior.

Soft earth pellets (SEP)

Soft earth pellets include soft fertilizer pellets and any other non-toxic material of a similar consistency.

Stones (STNS)

Stones include hard shale, coal, hard earth pellets, fertilizer pellets and other non-toxic materials of similar consistency.

Other factors

By-products of a manufacturing process

By-products of a manufacturing process are materials such as malt sprouts, oat hulls, ground and pelleted material. They do not qualify as grain screenings.

If inspection is requested on material that is wholly or partly processed grain screenings, it is graded *Sample* according to the dominant product, for example, *Sample Malt Sprouts, Sample Screenings, Ground; Sample Oat Hulls*.

Pelleted screenings

When official weighing or inspection of pellets made from Canadian grain screenings is requested, the official description is *Canadian ground and pelleted screenings*.

At the request of a shipper, you may show the prime source of screenings in parentheses following the description, for example, *Canadian ground and pelleted screenings (flaxseed)*.

If you are in doubt about the source, you may request a letter of certification from the shipper certifying the source of the screenings. Shippers may also request to have the word *grain* included in the description of the pellets, for example, *Canadian ground and pelleted grain screenings*.

Pellets received into terminal elevators made from processing residues of agricultural products are described as simply as possible, for example, *Canadian canola extraction pellets, Canadian wheat bran pellets, Canadian beet pulp pellets.* You must be reasonably certain of the source or country of origin.

Cleaning screenings

Feed screenings

1. Divide a representative portion of approximately 500 g from the sample.
2. Sift the portion over the No. 4.5 round-hole sieve to assess the percentage of small weed seeds, chaff, hulls, dust, etc.
3. Handpick a representative portion of at least 10 g to determine the components of the sample.
4. Show the composition in detail in all records and endorse the backs of certificates.

Uncleaned screenings

Uncleaned screenings do not meet the specifications for No. 1 or No. 2 Feed screenings because of their content of weed seeds, hulls, chaff or dust. Uncleaned screenings must contain at least 35.0% of material that if separated would meet the grade requirements for No. 1 Feed screenings.

1. Divide a representative portion of not less than 750 g from the uncleaned sample.
2. Sift the portion over the No. 4.5 round-hole sieve to assess the percentage by weight of small weed seeds and dust.
3. Handpick a representative portion not less than 10 g to determine the components of the sample.
4. Show the composition of the sample in detail on all records and endorse the backs of certificates.

Refuse screenings

Refuse screenings do not meet the grade requirements for *Uncleaned screenings* because of their content of weed seeds, chaff or dust.

1. Divide a representative portion of not less than 250 g from the uncleaned sample.
2. Sift the representative portion over the No. 5 buckwheat and the No. 4.5 round-hole sieves nested to determine the percentage by weight of seeds.
3. Class as large seeds those that pass through the No. 5 buckwheat sieve but remain on top of the No. 4.5 round-hole.
4. Class as small seeds material that passes through the No. 4.5 round-hole sieve.
5. Handpick a representative portion of at least 25 g of the material remaining on top of the 5 buckwheat sieve.

Notation as to kind

When no written request is received for a notation as to kind, such a notation is entered on the records only and it is stated that the notation does not appear on the certificate, for example, *Canola—not shown on certificate*.

Grade determinants tables

Screenings

			Maximum tolerances, including canola, rapeseed, wild and domestic mustard seed						
				Maximum tolerances, including weed seeds which pass through a No. 4.5 round-hole sieve, chaff, dust					
						Knuckles and straw			
Grade name	**Standard of quality**	**Minimum quantity of shrunken or broken grain %**	**Hare's ear or wild mustard seed %**	**Hulls %**	**Soft earth pellets %**	**Straw %**	**Total %**	**Total %**	**Total %**
No. 1 Feed Screenings	Must be cool and sweet	35	2	1	1	**0.25**	3	3	6
No. 2 Feed Screenings	Must be cool and sweet	No minimum	2	1	1	**0.25**	3	3	10
Uncleaned	No requirements	*	*	*	3	5	5	*	*
Refuse	No requirements	No minimum	No limit	No limit	3	No limit	No limit	No limit	No limit
Grade, if specs not met	*(Grade name)", Account Heated, or Fireburnt, or Odour*				*Sample Screenings, Account Soft Earth Pellets*				

			Injurious seeds								
Grade name	**Ergot %**	**Excreta %**	**Other than hare's ear or wild mustard seed %**	**Total %**	**Other domestic grains %**	**Other large seeds %**	**Sclerotinia %**	**Stones %**	**Wild buckwheat %**	**Wild oats %**	**Wild oat hulls %**
No. 1 Feed Screenings	0.1	0.02	1	2	Nil	10	**0.25**	0.3	65	8	N/a
No. 2 Feed Screenings	0.1	0.02	1	2	5	No limit	**0.25**	0.3	No limit	49	N/a
Uncleaned	0.1	0.1	*	*	10	*	**0.25**	0.5	*	49	1
Refuse	0.1	0.1	No limit	No limit	10	No limit	**0.25**	0.5	No limit	No limit	No limit
Grade, if specs not met	*(Grade name) Screenings, Ergoty*	*Sample Screenings, Account Excreta*			*Sample Screenings, with composition in remarks*		*Sample Screenings, Account Sclerotinia*	*Sample Screenings, Account Stones*		See *Mixed feed oats*	

*** Sample must contain 35% of material that qualifies for No. 1 Feed Screenings**

Mixed Feed Oats

Cleaning

1. Divide a representative portion of at least 750 g from the uncleaned sample.
2. Sift the representative portion over the No. 4.5 round-hole sieve to remove up to 1% by weight of small weed seeds, chaff and dust.

   If more than 1% of small seeds, chaff and dust passes through the No. 4.5 round hole sieve,
   1. Assess dockage.
   2. Record dockage to the nearest 0.1%.
3. Handpick soft earth pellets from the cleaned sample.
   - For samples containing up to 10% by weight of soft earth pellets, assess earth pellets as dockage.
   - For samples containing over 10% soft earth pellets by weight, grade *Sample Screenings, Account Earth Pellets*.
4. Show the composition in detail on all records for carlots and cargoes.

Composition

Samples must contain at least 50% by weight of wild oats.

Grade name	Material through No. 4.5 round-hole sieve %	Wild buckwheat, wheat heads, knuckles, straw and chaff			
		Knuckles, straw and chaff %	Wheat heads %	Wild buckwheat %	Total %
Mixed Feed Oats	1	4	5	5	5
No. 2 Mixed Feed Oats	1	4	5	5	10
Grade, if No. 2 specs not met	Report as dockage to the nearest 0.5%				

Grade name	Ergot %	Excreta %	Flaxseed %	Heated %	Other domestic grains %	Sclerotinia %	Stones %
Mixed Feed Oats	0.25	0.02	5	5	5	0.25	0.1
No. 2 Mixed Feed Oats	0.33	0.02	5	10	5	0.25	0.2
Grade, if No. 2 specs not met	*Mixed Feed Oats, Ergoty*	*Mixed Feed Oats, Excreta*		*Mixed Feed Oats, Heated*		*Sample Screenings Account Sclerotinia*	*Sample Screenings Account Stones*

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Criteria for designation as experimental grades

Experimental grades for selected varieties of wheat and barley have been established to allow the Canadian Wheat Board to market test varieties that do not readily fit into the existing grade structure, but which show some promise for acceptablility in world markets.

A variety is eligible to be assigned to the grades defined in the experimental grade schedules only if the variety is designated by one of

- Agriculture and Agri-Food Canada
- Canadian Wheat Board
- Canadian Grain Commission

The criteria for a variety to be eligible for designation are

- There is evidence that Canadian producers will derive a benefit from its production either immediately or in the future.
- There is supportive data for its agronomic characteristics and end-use quality.
- The variety will be produced under contract to the Canadian Wheat Board.
- The variety will remain in the program for a specified period.

When a variety is no longer eligible for the experimental grades, the Canadian Wheat Board purchases and disposes of all existing stocks to prevent adulteration of registered varieties, unless the Canadian Grain Commission establishes a grade schedule for that variety and any other varieties of that grain having similar qualities.

Wheat

Classes and varieties

A variety from any class of wheat may be approved for eligibility for experimental grades. The class of wheat is noted in the remarks on inspection records.

Samples containing admixtures of registered Canadian or foreign varieties in excess of 5.0% by weight are graded *Canada Western Feed*.

Cleaning

- Dockage is assessed using the procedures described in Chapter 4 of this Guide.
- All special cleaning described in Chapter 4 is applied to experimental grades, provided that the grade can be improved.

Grading factors

Samples eligible for experimental grades but displaying grading factors other than stones that are above established tolerances are graded *Canada Western Feed* or *Sample* depending on the severity of the grading factors.

Contaminated grain

▲ **Important:** Wear gloves and a mask to handle any sample that is suspected of containing contaminated grain.

Contaminated is defined in the *"Canada Grain Act"* as; "Contaminated means, in respect of grain, containing any substance in sufficient quantity that the grain is unfit for consumption by persons or animals or is adulterated within the meaning of the regulations made pursuant to sections B.01.046(1), B.15.001 and B.15.002(1) of the *Food and Drugs Act.*"

Samples deemed to be contaminated by the Grain Research Laboratory in consultation with the Chief Grain Inspector for Canada are graded *Wheat, Sample Condemned.*

Degermed

Tolerances apply to kernels not classed as sprouted.

Fertilizer pellets (FERT PLTS)

Fertilizer pellets are typically either small, round and white or irregular shaped and pink or red. Fertilizer pellets are not considered a hazardous substance however there is no visible means of assuring that material resembling fertilizer pellets is not some other contaminant.

Representative portion for analysis

Minimum	Optimum	Export
working sample	working sample	working sample

Procedures

- Handpick any fertilizer pellets and determine the concentration basis the net working sample.
- Fertilizer pellets are assessed as stones when the concentration does not exceed 1.0% of the net sample weight.
- Samples containing fertilizer pellets in excess of 1.0% of the net sample weight are graded *Wheat, Held IP Suspect Contaminated Grain.*

Note: Canadian Grain Commission personnel should refer to ISO national work instruction "*Suspect Contaminated Grain, Handling Procedures*" for procedures to be followed when handling samples containing fertilizer pellets.

Grass green

Tolerances are only a guide. Consider the overall quality of the sample.

Hard vitreous kernels

Vitreousness is the natural translucent colouring that is a visible sign of kernel hardness. It is a factor for hard wheat varieties only. For a full description, see Chapter 4.

Insect damage

Consider the overall quality of the sample.

Stones (STNS)

Stones are hard shale, coal, hard earth pellets, and any other non toxic materials of similar consistency. Fertilizer pellets are assessed as stones when constituting 1.0% or less of the net sample weight. (See *Fertilizer pellets* for specific procedures to be followed when samples contain fertilizer pellets.)

Representative portion for analysis

Minimum—500 g	Optimum—1000 g	Export—1000 g

Procedures

1. Handpick stones from a representative portion of the cleaned sample.
2. Determine stone concentration in the net sample.

Note: Stones may be removed and included in dockage if the the material removed is 5.0% or less of the gross weight of the sample. See *Cleaning for grade improvement*.

- In western Canada samples of grain containing stones in excess of "basic grade" tolerances, up to 2.5% are graded *Wheat, Rejected "basic grade" Account Stones*. The "*basic grade*" refers to a grade established in the Canada Grain Regulations (grades listed in the first column in grade determinant tables) that would have been assigned to the sample if it contained no stones.
- In western and eastern Canada grain containing more than 2.5% stones is graded *Wheat, Sample Salvage.*

Examples: Western Canada

Excerpt from grade determinant tables for
Wheat, Canada Western Experimental

Grade name	Stones %
No. 1 CW EXPRMTL	0.03
No. 2 CW EXPRMTL	0.03
No. 3 CW EXPRMTL	0.06
CW Feed	0.10

Basic grade:......................... *Wheat, No. 3 Experimental*
Reason for basic grade:....... Mildew

If the above sample contained	Grade in Western Canada
0.08% stones	*Wheat, Rejected No. 3 CW Experimental Account Stones*
3.0% stones	*Wheat, Sample Salvage*

Treated seed and other chemical substances

Treated seed

Treated seed is grain that has been coated with an agricultural chemical for agronomic purposes. These seed dressings contain a dye to render the treated seed visually conspicuous. The colour of the dye varies depending upon the type of treatment and the type of grain. The current Canadian colour standards for pesticide seed treatments for cereals is pink or red and for canola is baby blue, white and green. Seed treated with an inoculant may have a green stain. The coatings or stains may appear greasy or powdery and surface area distribution ranges from tiny flecks to complete coverage.

Other chemical substances

Other chemical substances refers to any chemical residues either adhering to the kernel or remaining in the sample and to samples having a chemical odour of any kind.

▲ **Important:** Wear gloves and a mask to handle any samples that you suspect may contain contaminated grain.

Representative portion for analysis

Minimum	Optimum	Export
working sample	working sample	working sample

Procedures

If a sample is suspected of being coated with a pesticide, desiccant, inoculant or if the sample contains evidence of any foreign chemical substance other than fertilizer pellets, the sample shall be graded *Wheat, Held IP Suspect Contaminated Grain*.

Note: Canadian Grain Commission personnel should refer to ISO national work instruction "*Suspect Contaminated Grain, Handling Procedures*" for specific procedures to be followed when handling samples suspected of containing treated seed or other chemical substances.

Primary grade determinants tables

Wheat, Canada Western Experimental (CW EXPRMTL)

	Standard of quality				Foreign material						Wheats of other classes or varieties	
Grade name	**Minimum test weight kg/hL (g/0.5 L)**	**Variety**	**Degree of soundness**	**Minimum hard vitreous kernels %**	**Ergot %**	**Excreta %**	**Matter other than cereal grains %**	**Sclerotinia %**	**Stones %**	**Total %**	**Contrasting classes %**	**Total %**
No. 1 CW EXPRMTL	79 (385)	Any wheat variety of the class Canada Western Experimental designated as such by Order of the Commission	Reasonably well matured, reasonably free from damaged kernels	65	0.01	0.01	0.2	0.01	0.03	0.4	0.5	1.5
No. 2 CW EXPRMTL	77.5 (378)		Fairly well matured, may be moderately bleached or frost-damaged, reasonably free from severely damaged kernels	35	0.02	0.01	0.2	0.02	0.03	0.75	1.5	3
No. 3 CW EXPRMTL	76.5 (373)		May be frost-damaged, immature or weather-damaged, moderately free from severely damaged kernels	No minimum	0.04	0.015	0.2	0.04	0.06	1.25	2.5	5
CW Feed	65 (315)	Any type or variety of wheat excluding amber durum	Reasonably sweet, excluded from other grades of wheat on account of damaged kernels	No minimum	0.1	0.03	1	0.1	0.1	10	No limit—but not more than 10% amber durum	
Grade, if specs for CW Feed not met	*Wheat, Sample CW Account Light Weight*				*Wheat, Sample CW Account Ergot*	*Wheat, Sample CW Account Excreta*	*Wheat, Sample CW Account Admixture*	*Wheat, Sample CW Account Admixture*	2.5% or less–*Rejected (grade) Account Stones* Over 2.5%–*Wheat, Sample Salvage*	See *Mixed grain*	Over 10% amber durum—*Wheat, Sample CW Account Admixture*	

Wheat, Canada Western Experimental (CW EXPRMTL), continued

Grade name	Artificial stain, no residue %	Dark, immature %	Degermed %	Fireburnt %	Fusarium damage %	Grass green %	Grasshopper, army worm %	Heated, binburnt, severely mildewed, rotted, mouldy
No. 1 CW EXPRMTL	Nil	1	4	Nil	0.25	0.75	1	0.05% including 1 binburnt kernel per 1000 g
No. 2 CW EXPRMTL	5K	2.5	7	Nil	1.0	2	3	0.4% including 4 binburnt kernels per 1000 g
No. 3 CW EXPRMTL	10K	10	13	Nil	2	10	8	1.0% including 6 binburnt kernels per 1000 g
CW Feed	2	No limit	No limit	2	5	No limit	No limit	2.5% including 2.5% binburnt kernels
Grade, if specs for CW Feed not met	*Wheat, Sample CW Account Stained Kernels*			*Wheat, Sample CW Account Fireburnt*	Over 5%—*Wheat, Sample CW Account Fusarium Damage* Over 10%– *Wheat, Commercial Salvage*			*Wheat, Sample CW Account Heated*

Grade name	Natural stain %	Pink %	Sawfly, midge %	Shrunken and broken			Smudge and blackpoint		Sprouted	
				Shrunken %	Broken %	Total %	Smudge %	Total %	Severely sprouted %	Total %
No. 1 CW EXPRMTL	0.5	1.5	2.0	4	5	7	30K	10	0.1	0.5
No. 2 CW EXPRMTL	2	5	5	4	6	8	1	20	1.5	
No. 3 CW EXPRMTL	5	10	10	4	7	9	5	35	5	
CW Feed	No limit	No limit	No limit	4	13	15	No limit	No limit	No limit	
Grade, if specs for CW Feed not met					*Sample Broken Grain*					

K Number of kernel-sized pieces in 500

Barley

Experimental grades of barley eligible for sample grades are graded with reference to Canada Western. The term Experimental is removed from the grade name. For example, *Barley, Sample CW, Account Heated.*

Cleaning and determination of dockage

- Dockage is assessed using the procedures described in Chapter 6 of this Guide.
- All special cleaning described in Chapter 6 is applied to experimental grades, provided that the grade can be improved.

Grading factors

Normal grading factors for barley apply to experimental grade of barley.

Samples eligible for experimental grades but displaying grading factors other than stones over established tolerances are graded *General Purpose* or *Sample*, depending on the severity of the factors.

Contaminated grain

▲ **Important:** Wear gloves and a mask to handle any sample that is suspected of containing contaminated grain.

Contaminated is defined in the *"Canada Grain Act"* as; "Contaminated means, in respect of grain, containing any substance in sufficient quantity that the grain is unfit for consumption by persons or animals or is adulterated within the meaning of the regulations made pursuant to sections B.01.046(1), B.15.001 and B.15.002(1) of the *Food and Drugs Act.*"

Samples deemed to be contaminated by the Grain Research Laboratory in consultation with the Chief Grain Inspector for Canada are graded *Barley, Sample Condemned.*

Fertilizer pellets (FERT PLTS)

Fertilizer pellets are typically either small, round and white or irregular shaped and pink or red. Fertilizer pellets are not considered a hazardous substance however there is no visible means of assuring that material resembling fertilizer pellets is not some other contaminant.

Representative portion for analysis

Minimum—working sample
Optimum—working sample
Export—working sample

Procedures

- Handpick any fertilizer pellets and determine the concentration basis the net working sample.
- Fertilizer pellets are assessed as stones when the concentration does not exceed 1.0% of the net sample weight.
- Samples containing fertilizer pellets in excess of 1.0% of the net sample weight are graded *Wheat, Held IP Suspect Contaminated Grain.*

Note: Canadian Grain Commission personnel should refer to ISO national work instruction "*Suspect Contaminated Grain, Handling Procedures*" for procedures to be followed when handling samples containing fertilizer pellets.

Large oil-bearing seeds such as sunflower and soybean

To grade samples containing any large oil-bearing seeds such as sunflower seeds and soybeans, use the grade schedule for General Purpose barley.

Grade	Percentage allowed
No. 1 CW	nil
No. 2 CW	nil

Matter other than cereal grains (MOTCG)

To grade samples containing more than the allowed percentages of *Matter other than cereal grains*, excluding large oil-bearing seeds, use the grade schedule for General Purpose barley, or grade Sample.

Grade	Percentage allowed
No. 1 CW	0.2
No. 2 CW	0.5

Soft earth pellets

Soft earth pellets are pellets that crumble under light pressure—if they do not crumble, they are considered stones. These pellets can be

- Earth and fertilizer pellets
- Any non-toxic material of similar consistency

Earth pellets may be removed as dockage.

If soft earth pellets are over 10.0% of the gross weight of the sample, they become a grading factor.

1. Return the pellets to the sample.
2. Handpick soft earth pellets from a representative portion of 100 g of the cleaned sample.
3. If soft earth pellets is the grade determinant, grade the sample *Barley, Sample CW Account Admixture.*

Export shipments of barley must be practically free of earth pellets.

Stones (STNS)

Stones are hard shale, coal, hard earth pellets, and any other non toxic materials of similar consistency. Fertilizer pellets are assessed as stones when constituting 1.0% or less of the net sample weight. (See *Fertilizer pellets* for specific procedures to be followed when samples contain fertilizer pellets.)

Representative portion for analysis

Minimum—500 g	Optimum—1000 g	Export—1000 g

Procedures

1. Handpick stones from a representative portion of the cleaned sample.
2. Determine stone concentration in the net sample.

Note: Stones may be removed and included in dockage if the the material removed is 5.0% or less of the gross weight of the sample. See *Cleaning for grade improvement*.

- In western Canada samples of grain containing stones in excess of "basic grade" tolerances, up to 2.5% are graded *Barley, Rejected "basic grade" Account Stones*. The "*basic grade*" refers to a grade established in the Canada Grain Regulations (grades listed in the first column in grade determinant tables) that would have been assigned to the sample if it contained no stones.
- In western and eastern Canada grain containing more than 2.5% stones is graded *Barley, Sample Salvage*.

Examples: Western Canada

Excerpt from grade determinant tables for
Barley, Canada Western Experimental

Grade name	Stones
No. 1 CW EXPRMTL	1K
No. 2 CW EXPRMTL	2K

K Number of kernel-sized pieces in 500 g

Basic grade:......................... *Barley, No. 1 CW Experimental*

If the above sample contained	Grade in Western Canada
2K stones	*Barley, Rejected No. 1 CW Experimental Account Stones*
3.0% stones	*Barley, Sample Salvage*

Treated seed and other chemical substances

Treated seed

Treated seed is grain that has been coated with an agricultural chemical for agronomic purposes. These seed dressings contain a dye to render the treated seed visually conspicuous. The colour of the dye varies depending upon the type of treatment and the type of grain. The current Canadian colour standards for pesticide seed treatments for cereals is pink or red and for canola is baby blue, white and green. Seed treated with an inoculant may have a green stain. The coatings or stains may appear greasy or powdery and surface area distribution ranges from tiny flecks to complete coverage.

Other chemical substances

Other chemical substances refers to any chemical residues either adhering to the kernel or remaining in the sample and to samples having a chemical odour of any kind.

▲ **Important:** Wear gloves and a mask to handle any samples that you suspect may contain contaminated grain.

Representative portion for analysis

Minimum—working sample	Optimum—working sample	Export—working sample

Procedures

If a sample is suspected of being coated with a pesticide, desiccant, inoculant or if the sample contains evidence of any foreign chemical substance other than fertilizer pellets, the sample shall be graded *Barley, Held IP Suspect Contaminated Grain.*

Note: Canadian Grain Commission personnel should refer to ISO national work instruction "*Suspect Contaminated Grain, Handling Procedures*" for specific procedures to be followed when handling samples suspected of containing treated seed or other chemical substances

Primary grade determinants tables

Barley, Canada Western Experimental (CW EXPRMTL)

	Standard of quality				Foreign material						
Grade name	**Minimum test weight kg/hL (g/0.5L)**	**Variety**	**Minimum designated variety %**	**Degree of soundness**	**Ergot %**	**Inseparable seeds %**	**Other cereal grains %**	**Sclerotinia %**	**Stones**	**Wild oats %**	**Total %**
No. 1 CW EXPRMTL	62 (298)	Any barley variety of the class Canada Western Experimental designated as such by Order of the Commission	95	Practically sound, reasonably well matured, may contain slightly weather-damaged but not badly stained or discoloured kernels	0.02	0.2	1	0.01	1K	0.5	1
No. 2 CW EXPRMTL	60 (288)		90	Reasonably sound, fairly well matured, may contain moderately weather-damaged but not severely discoloured kernels	0.05	0.2	3	0.01	2K	1	3
Grade, if No. 2 specs not met					General purpose barley or sample grades				2.5% or less—*Barley, Rejected (grade) Account Stones* Over 2.5%—*Barley, Sample Salvage*	General purpose barley or sample grades	

	Damage						
		Frost			Peeled and broken		
Grade name	**Fireburnt %**	**Severe %**	**Total %**	**Heated, rotted or severely mildewed %**	**Primary %**	**Ex terminal %**	**Sprouted %**
No. 1 CW EXPRMTL	Nil	0.2	5	Nil	4	5	Nil
No. 2 CW EXPRMTL	Nil	2	5	0.05	5	6	0.5
Grade, if No. 2 specs not met	General purpose barley or sample grades						

25. Sample feed grain

Determination of dockage

Samples are graded using procedures for sample feed grain when they exceed the Broken tolerances for Mixed Grain.

▲ **Important:** When a sample is to be graded as sample feed grain,

1. Return dockage to the cleaned sample.
2. Begin cleaning and dockage assessment using the procedures described in this section.

Dockage is assessed to the nearest 0.1% on all samples.

Normal cleaning procedures

1. Using a Boerner-type divider, divide the uncleaned sample to obtain a representative portion.
   - Official samples should be at least 900 grams.
   - Unofficial samples must be at least 750 grams.
2. Sieve the sample over the No. 4.5 round-hole hand sieve, using approximately 250 g at a time.

Composition of dockage

Dockage contains

- Material that passes through the No. 4.5 round-hole sieve
- Material removed by special cleaning for grade improvement

Cleaning for grade improvement

If the grade of a sample can be improved by additional cleaning, perform the cleaning and add the additional material to dockage. Cleaning for grade improvement can be done at any time after normal cleaning.

1. Use a No. 6 or a No. 5 buckwheat hand sieve to remove large seeds. Large seeds are removed if their total weight exceeds 3% of the cleaned sample by weight.
2. Record the additional cleaning and dockage on inspection records.

Primary and export grade determinants tables

Sample feed grain

Grade name	Foreign material												
					Large material								
	Ergot %	Excreta %	Flaxseed %	Fusarium %	Wheat heads %	Knuckles and straw %	Large weed seeds %	Total %	Sclerotinia %	Soft earth pellets %	Stones %	Wild oats %	Total large material and wild oats %
Sample feed grain	0.33	10	5	4	10	4	3	10	0.25	0.33	0.1	49	50
	Sample Feed Grain, Ergoty	*Sample (with components named)*	*Sample (with components named)*	*Sample (with components named)*	*Sample (with components named)*	*Sample (with components named)*	*Sample (with components named if not removable with approved sieves)*	*Sample (with components named)*	*Sample Feed Grain, Sclerotinia*	*Sample, Feed Grain, Soft Earth Pellets*	2.5% or less—*Sample Feed Grain, Stones* Over 2.5%—*Sample Feed Grain, Sample Salvage*	*Mixed Feed Oats*	*Sample (with components named)*

Large weed seeds includes other grains such as peas, corn, domestic buckwheat, etc.
Samples containing over 3.0% by weight are graded *Sample* and the components are named.
Soft earth pellets are included in total of large seeds.

Grade name	Damage		
	Broken grain %	Fireburnt %	Heated %
Sample feed grain	50	2	5
	Sample Broken Grain (class on request)	*Sample Feed Grain, Fireburnt*	*Sample Feed Grain, Heated*

26. Standard abbreviations

The following standard abbreviations are used in inspection reports, official records and in conjunction with ISA, the Industry Services Automation program.

A

account	AC*
adhered hulls	ADHULLS
adhered soil	ADHS
admixture	ADMX
all rail	A/R
alternate grade	ALT GRD
amber durum	ADUR*
appears to be	ATB
approximately	APPROX
artificial stain	ART STND
aspiration	ASP
attrition	ATT
Azuki (Adzuki)	AZU*

B

barley	BLY*
barley of other classes	BOOC
barley of other types	BOOT
beans	BEN
binburnt	BBT*
black hilum	BHIL
black turtle	BKT*
blackeye	BKE
blackpoint	BLK PT
bleached	BLCH*
blue-eye mould	BEM
brake end	BE
bran pellets	BRAN PLTS
broken	BKN*
broken after cleaning	BKNACL
broken and shrunken	BKN&SHR
broken deducted	BKN DED
broken grain	BKN GRN*
broken left	BKN LEFT
broken or shrunken	BKN OR SHR
brown	BRN*
brown hilum	BRNHIL

An asterisk (*) beside a definition indicates that it is also defined in the Canada Grain Regulations.

buckwheat	BWT*

C

Canada	CAN*
Canada Eastern	CE*
Canada Prairie Spring	CAN PRIE SPG
Canada Western	CW*
Canada Western Red Spring	CWRS
Canada Western Red Winter	CWRW
canario	CNRO
canary seed	CNY SD*
canola	CNL*
canola and mustard	CNL & MUS
canola / mustard seed	CNL/MUS
canola meal	CNL MEAL
Century	CNTY*
cereal grain	C GRN
chaff	CHF
chaff and dust	CHF & DUST
chlorophyll	CHLL
clover	CLV
cockle	COC
cockle other classes	COC OCL
colour, colours	CLR*
composite	COMP
condemned	CNDM*
conspicuous admixture	CADMX
container	CONT
contaminated	CONTAM
contrasting classes	CON CL*
contrasting colours	CON CLR
corn	CRN*
cow cockle	CCOC
cracked	CRKD
cracked corn	CC
cracked corn and foreign material	CC&FM*
cracked seed coat	CSDC*
cracked seed coats including splits	CSDC&SPLTS
cranberry	CBY*

D

damage	DMG
damaged	DMGD*
damage, foreign material and contrasting classes	DMGFMCONCL*
damp	DP*
damp extra	DP EX
damp sample	DP SPLE

An asterisk (*) beside a definition indicates that it is also defined in the Canada Grain Regulations.

damp sample Canada	DP SPLE CAN
dark green speckled	DGS
dark immature	DKIM
dark hilum	DHIL
dark red kidney	DRK*
Dashaway	DSHY
deducted	DED
degermed	DGM
dehulled	DHULL
dehulled seed	DHULL SD
dehydrated	DEH
destination	DEST
destroyed	DST
different	DIFF
different classes combined	DCC*
different grades combined	DGC*
discoloured	DCLR
distinctly detrimental	DDET
distinctly green	DGR
dockage	DKG
domestic	DOM
domestic seeds and green and tfm	DSDSGRNTFM
downy mildew	DWNY MIL
Dutch brown	DBR*

E

earth pellets	EP*
eastern	E
elevator	ELEV
empty, clean and dry	ECD
ergot	ERG*
ergoty	ERGY*
excreta	EXCR*
experimental	EXPRMTL*
export ready	ER
extra	EX*
extra strong red spring	EXSTG RS

F

fababeans	FBN*
fair colour	FCLR
fairly good colour	FGCLR
fairly sound	FSND
fairly sweet	FST
feed	FD*
fertilizer	FERT

An asterisk (*) beside a definition indicates that it is also defined in the Canada Grain Regulations.

fertilizer pellets	FERT PLTS*
Finale	FNLE
fireburnt	FBNT*
flaxseed	FLX*
flax pellets	FLX PLTS
fm is excluded as a grading factor	FMXGF
foreign material	FM*
foreign material excluding cereal	FMXCGRN
foreign material excluding cereal grains and wild oats	FMXCGRNWO
foreign material excluding grain	FMXGRN
foreign material excluding other grains	FMXOG
foreign material excluding other cereal grains	FMXOCG
foreign material not grain	FMXGRN
frost	FR
frost/heat stress	FRHTS
frost light	FRL
frost severe	FRS
frost total	FRT
fusarium damage	FUS DMG
fusarium mould	FUS MLD

G

good natural colour	GNCLR
grade	GRD
grade improvement	GRDIMP
graded according to 1993/94 specifications	GAS
grain	GRN*
gram	g
grass-green	GRASS GR
grasshopper, army worm	GAW
grasshopper parts	GPT
grey hilum	GHIL
Great Northern	GTN*
green	GR*
guaranteed	G

H

handpick	HP
handpick coarse material	HPCURSMTL
handpick earth pellets	HP EP
handpick foreign material	HP FM
handpick hulled seed	HP HULL SD
handpick inseparable material	HP INSPMTL
handpick other grain	HP OG
handpick roughage	HP RHGE
handpick vegetable matter	HP VM

An asterisk (*) beside a definition indicates that it is also defined in the Canada Grain Regulations.

hard virtreous kernels	HVK
hard white spring	HWS*
heated	HTD*
head rot	HEAD ROT
heated binburnt	HTDBBT
heavy	HVY
held	HLD*
hp coarse material	HPCURSMTL
hulled	HULL
hulled and broken	HULLBKN
hulls	HULLS

I

identity preserved	IP*
immature	IM
inconspicuous admixture	INC ADMX
inert material	INERT MTL
Indianhead	INDNHD
inferior variety	INF VAR
injurious seeds	INJ SDS
insect damage	I DMG*
insect excreta	I EXCR
insect parts	I PARTS
inseparable admixture	INSEPADMX
inseparable seeds	INSEP SDS
invisible loss	INV

K

kernels	KRNL
kilograms	kg
kilograms per hectolitre	kg/hL
knuckles	KNKLS*
knuckles and straw	KNKL&STR
knuckles, straw and chaff	KNKLSSTRCHF

L

lady's thumb	LTHMB
large seeds	LSDS
large seeds and broken grain	LSDS & BKN GRN
large seeds and chaff	LSDS&CHF
large seeds and small seeds	LSDS&SSDS
large seeds left in	LSDS LEFT
large seeds other than wild buckwheat	LSDS XW BWT
lb/bu Winchester	WLB

An asterisk (*) beside a definition indicates that it is also defined in the Canada Grain Regulations.

Lenca	LNCA*
lentils	LNT*
light	LT
light red kidney	LRK*
lightweight	LTWT

M

machine separation	MS
malt barley	MBL
malt pellets	MALT PLTS
maple	MAP*
material	MTL
material other than splits	MOTSPLTS
matter other than cereal grains	MOTCG
mechanical damage including splits	MDMGINCSPLTS
midge	MDGE
mildew	MIL*
mildewed kernels	MIL KRNL*
millet	MLT*
mineral matter	MIN MAT
mineral matter including stones	MINMATINCSTNS
mixed	MXD*
mixed classes	MXD CL
mixed colours	MXD CLR*
mixed grain	MXG*
mixed types	MXD TYP
mixed varieties	MXD VAR
moderate weathering	MWEATH
moist	MT*
moist sample	MT SPLE
moisture test	MST
mouldy	MLDY
mouldy kernels	MLDY KRNL*
mustard seed	MUS
musty	MUSTY

N

natural stain	NSTN
net dockage	NET DKG
no brake end	NBE
non-registered varieties	NON REGV
not commercially clean	NCC*
not of good natural colour	NGNCLR
not officially inspected	NOFFINSP
not ready for export	NRE
not reasonably sweet	NREASST

An asterisk (*) beside a definition indicates that it is also defined in the Canada Grain Regulations.

not uniform in size	NUS
not well screened	NWSCD
number	NO
numbers	NOS

O

oats	OAT
oat pellets	OAT PLTS
objectionable	OBJ
objectionable odour	OBJ ODOR
odd heated	ODD HTD
odour	ODOR*
off-colour	OFFCLR
oil	OIL
oriental	ORIENT*
other	OTHER
other cereal grain	OCG
other cereal grain and other matter	OCGOM
other cereal grains excluding wheat	OCGXWHT
other cereal grains excluding wheat and barley	OCGXWHT&BLY
other classes	OCL
other classes of beans that blend	OCLBB*
other classes of flax	OCLFLX
other classes that blend	OCL BL
other colours	OCLR
other conspicuous admixture	OCA
other damaged	ODMG
other distinctly detrimental seeds	ODDET
other foreign material	OFM
other grain	OG
other grain not wheat	OGXWHT
other grains	OGS
other hulless variety	OHLSVAR
other inseparable admixture	OINSEPADMIX
other large seeds	OLSDS
other matter	OM
other pulses	OPLSE
other than	OT
other varieties	OVAR
out of	EX

P

partition	PART
peabean	PBN*
peas	PEA
peas of other colours	POOCLR

An asterisk (*) beside a definition indicates that it is also defined in the Canada Grain Regulations.

peeled	PLD
peeled and broken	PLD BKN
peeled, split and broken	PLDSPLTBKN
pelleted	PLTD*
pelleted screenings	PLTD SCG
pellets	PLTS*
penetrated	PENT
penetrated smudge	PENT SM
perforated	PERF
perforation damage	PERF DMG
pink	PNK*
pink kernels	PNK KRNL
pinto	PNT*
plump	PLMP
poor colour	PCLR
prairie	PRIE*
probe	P
protein	PROT
pulses other than green or yellow peas	PULSESOTGRORYELPEA
pure	PURE

Q

quality	QUAL

R

ragweed	RAG WD
rapeseed	RPE*
reasonably good colour	RGCLR
reasonably good natural colour	RGNCLR
reasonably sound	REASSND
red	R
red smudge	R SM
red spring	RS*
red winter	RW*
registered	REG
rejected	REJ*
riddle	RDLE
rotted	ROT
rotted kernels	ROT KRNL*
roughage	RHGE
roughage and aspiration	RHGE&ASP
rough awn	RAWN
round-hole	RH
rye	RYE

An asterisk (*) beside a definition indicates that it is also defined in the Canada Grain Regulations.

rye pellets	RYE PLTS

S

safflower	SAF
safflower seed	SAFF SD*
said to be	STB*
salvage	SLVG*
sample	SPLE*
sample Canada	SPLE CAN
sample feed grain	SFG*
sample spilt	SPLE SPILT
sample too small	STS*
sawfly	SFLY
scab damage	SCAB DMG
scanner colour	SCAN CLR
Sclerotinia sclerotiorum	SCL*
screenings	SCG*
seed	SD*
seed coats	SDC
seeds	SDS
seeds and destroyed	SDS&DST
select	SEL*
separation	SEPN
severe midge damage	SEVMDGE
severely mildewed	SEVMIL
severely sprouted	SEVSPTD
shale	SHALE
shrivelled	SHV*
shrunken	SHR
sieve	SVE
sieves	SIEVES
six-row	6 ROW*
slightly stained	SSTND
slotted	SLTD
slotted sieve	SLTD SVE
slotted sieve #5.5	SL5.5
small broken	SBKN
small red	SRD*
small seeds	SSDS
small seeds and dust	SSDS&DUST
smooth awn	SAWN
smudge	SM
smudge including blackpoint	SMINCBLKPT
smudge total	TOT SM
smut	SMUT
smutty	SMTY
soft earth pellets	SEP
soft white	SW

An asterisk (*) beside a definition indicates that it is also defined in the Canada Grain Regulations.

soft white spring	SWS*
solin	SLN
sorghum	SRG*
sound	SND
soybeans	SYB*
soybeans of other colours	SOOCLR
special	SPEC*
special bin	SPEC BIN*
special cleaning	SCLN
special machine separation	SMS
special select	SPECSEL*
split	SPLT
splits, damage, foreign material and contrasting classes	SPDMGFMCC*
splits in dockage	SPLTSDKG
spring	SPG*
sprouted	SPTD*
stained	STND
stained kernels	STND KRNL*
standard	STD
starchy	STCH
stones	STNS
straw	STRAW
strong	STG
submitted	S
sunflower	SUN
sunflower seeds	SUN SDS*
superficial discolouration	SUPDISCLR

T

Tara	TARA
Tartarian buckwheat	TART BWT
test weight	TWT
thin	THIN
thin (5/64x3/4 slotted)	THIN(5/64X3/4)
tombstone	TOMBST*
tonne	t
total	TOT
total adhered hulls	TOTADHHL
total attrition and seeds	TATT&SDDS
total broken	TBKN
total cockle and sclerotia	TCOCSCL
total cockle and sclerotinia	TCOCSCL
total conspicuous admixture	TCA
total cracked seed coats including splits	TCSDCISPLT
total damage	TDMG
total damage and foreign material	TDMG&FM
total damage, foreign material, contrasting classes	TDMGFMCON

An asterisk (*) beside a definition indicates that it is also defined in the Canada Grain Regulations.

total damage, splits, foreign material and contrasting classes	TDMGSPFMCN
total distinctly detrimental	TDD
total dockage	TOT DKGE
total foreign material	TFM
total foreign material including other cereal grains	TFMINCOCG
total foreign material including sclerotia	TFMINCSCL
total including contrasting classes	TINCCONCL
total including damage, foreign material and contrasting classes	TINCDMGFMCONCL
total including inseparable seeds	TINCINSEPSDS
total including non-registered varieties	TINCNONREGVAR
total including splits, damage, foreign material and contrasting classes	TINCSPLTSDMGFMCONCL
total inseparable seeds	TINSEPSDS
total large seeds and wild oats	TLSD&WO
total other cereal grain	TOCG
total other classes and bleached	TOCLBLCH
total other oilseeds and inseparable seeds	TOOSDSINSEPSDS
total removable material	TRMAT
total roughage	TOT RHGE
total seeds and aspiration	TSDS&ASP
total seeds and attrition	TSDS&ATT
total seeds and roughage	TSDS&RHGE
total seeds and wild oats	TSDS&WO
total seeds roughage and attrition	TSDSR&A
total shrunken and broken	TSHRBKN
total small seeds and roughage	TSSDS&RHGE
total small seeds, chaff, dust and hulls	TSSDSCHFDUST&HULLS
total small seeds, roughage and attrition	TSSDSR&A
total smudge	TOT SM
total smudge and blackpoint	TSMBLKPT
total splits and damage	TSPLT DMG
total sprouted	TSPTD
total wheat heads knuckles straw and chaff	TWHDKNSTCF
total wheat of other classes	TWOOC
tough	TF*
tough sample	TF SPLE
tough sample canada	TF SPLE CAN
trace	TR
trace heated	TR HTD
trailer	TRLR
Trapper	TRAP*
triticale	TCL*
Triumph	TRPH*
truck	TRCK (T with EIS)
two-row	2 ROW*

U

unapproved variety	UNA VAR
United States of America	USA*

An asterisk (*) beside a definition indicates that it is also defined in the Canada Grain Regulations.

utility	U

V

varietal purity not guaranteed	VPNG
variety	VAR*
varieties with adhered hulls	VARADHHLS
vegetable matter	VM
very immature seeds	VIM SDS

W

warehouse	WHSE
weathered	WEATH
weed seeds in handpick	WDSDS HP
weight	WGT
western	W
wet	WT*
wet sample	WT SPLE
wheat	WHT*
wheat class declared by shipper	WCD
wheat heads	WHT HDS
wheat of other classes	WOOC
white hilum	WHIL
white hilum grain	WHIL GRN
white kidney	WKD*
white winter	WW*
whole grain	WHOLE GRN
wild buckwheat	W BWT
wild mustard	WM
wild mustard and canola/rapeseed	WM&CNL/RPE
wild mustard and rapeseed	WMRPE
wild oats	WO
winter	WIN

Y

yellow	YEL*
yelloweye	YLE*
yellow-seeded flax and solin	YELSDFLXSLN

An asterisk (*) beside a definition indicates that it is also defined in the Canada Grain Regulations.

An asterisk (*) beside a definition indicates that it is also defined in the Canada Grain Regulations.

27. Glossary

This section describes grading factors, procedures and common terms used in grading Canadian grain.

AAFC

Agriculture and Agri-Food Canada, the federal department of agriculture.

act

Canada Grain Act. See Canada Grain Act.

aeration

Aeration is the process of passing air currents through a grain stream. This process is used to remove objectionable odours or to preserve grain quality by reducing its temperature or moisture content.

armyworm damage

See insect damage.

ascochyta blight

Ascochyta blight is a fungal disease that attacks the leaflets, stems, petioles, pods, and seeds of lentil. Heavily infected seeds usually are characterized by a half-moon shaped, light to reddish or reddish brown spot on the edge of the seed. Occasionally it appears as a brown spot on the cheek of the seed.

Ascochyta blight was first reported in Canada in 1978 and has subsequently become a serious problem. It causes yield losses and severe seed discolouration in epidemic years.

attritional material

Attritional material is material other than small seeds and broken grain passing through the No. 4.5 round-hole sieve.

audit

An audit is the official weighing and inspection of stocks of grain, grain products, or screenings in a licensed elevator, to determine if an overage or shortage of stock exists. Intervals between audits and limits for overages and shortages are prescribed in the Regulations.

At licensed terminal and transfer elevators, audits are directed by CGC staff. At licensed primary and process elevators, operators need only to supply the CGC with stock reports.

automatic mechanical sampler

An automatic mechanical sampler is a device which extracts a small representative portion from the grain flow at regular intervals.

average samples

Average samples represent the visual quality of a grade of grain in a specific location at the end of a time interval. Average samples are composited to create official carlot unload samples, cargo samples or submitted samples, by elevator, by port, or by inspection district. They provide a means of monitoring grade levels and specific grading factors.

barley of other types

In two-row barley, barley of other types is any six-row variety. In six-row barley, barley of other types is any two-row variety.

Berlese funnel

A Berlese funnel is a device for collecting insects.

Grain suspected of being infested is placed in the funnel. The funnels used by Industry Services hold up to one kilogram of grain. The funnels are placed under lights. Insects move away from the lights down the funnel and are collected in receptacles placed under the funnels.

binburnt kernels

Binburnt kernels closely resemble fireburnt kernels in colour. However, in cross section, the binburnt kernel maintains its dense structure and appears smooth and glossy, unlike a fireburnt kernel, which looks like charcoal in cross-section, has numerous air holes, and crumbles easily under pressure.

Binburnt kernels are caused by gradual heating in storage and have not been exposed to temperatures approaching ignition.

The weight of a binburnt kernel is similar to that of a sound kernel of comparable size.
blackpoint
Blackpoint is a discolouration on the germ end of kernels of grain caused by numerous species of fungi and bacteria. Blackpoint is found in barley, triticale and wheat, although there is no separate tolerance defined for blackpoint in barley.

Kernels are susceptible during periods of rainfall or humidity above 90%, particularly during filling or maturation.

Blackpoint does not usually reduce yields, but it can reduce grade and quality.
Blackpoint is especially troublesome on durum wheat because black specks can appear in the semolina, making it undesirable for further processing.

bleached

Bleaching is an indication of exposure to wet conditions at or near maturity. Bleaching is caused by alternate wetting and drying of grain which causes tiny fissures to develop throughout the kernels. The fissures are caused because the grain swells a little when it is wet and doesn't dry back to the same size.

See *sprouted*.

Board grain

Board grains are western grains marketed under the control of the Canadian Wheat Board (CWB). These include western wheat and barley destined for the export market, as well as domestic sales of wheat and barley for human consumption.

Domestic feed wheat and domestic feed barley may be sold either on the open market or delivered to the CWB.

brake end

The brake end is the end of a railway car where the hand brake wheel is located. Compartments or partitions in a railcar are numbered sequentially beginning at the brake end.

bunt

Bunt is characterized the presence of bunt balls or black spores. Infected grain may have a fishy odour. Common bunt is a wheat disease caused by two closely related fungi, *Tilletia caries* and *Tilletia foetida*. The disease is also called stinking or covered smut. In infected plants, kernels on headed plants are replaced with bunt balls containing black powdery spores of the fungus.

Bunt balls can be removed by following procedures for cleaning for grade improvement, as long as there is no odour. If there is an odour, the presence of bunt balls is a grading factor in wheat. If there is no odour, but kernels are tagged with bunt, the sample is considered naturally stained.

Bunt reduces yield of infected crops, and it reduces the value of the crop, even in mildly infected crops. It is not as common as it once was in Canada, because we have developed effective control measures and new cultivars that are resistant to the disease.

Canada Eastern, Canada Western, Canada

These three terms form part of the grade name; for example, Canada Eastern White Spring wheat, or Canada Western select barley. The terms refer to the geographic area (eastern or western Canada) of production as defined in the Canada Grain Act, or to Canada generally.

Canada Grain Act

The Canada Grain Act is the statutory authority empowering the CGC to regulate grain handling in Canada and to establish and maintain quality standards for Canadian grain. It was first passed in 1912. The text of the Act can be found through the CGC web site at www.grainscanada.gc.ca.

Canada Grain Regulations

The Regulations are established by Section 116 of the Canada Grain Act. They govern grain-handling procedures and define grades for grain grown in eastern and western Canada.

canola

The term "canola" was trademarked in 1978 by the Western Canadian Oilseed Crushers' Association to differentiate the new superior low-erucic acid and low-glucosinolate varieties and their products from older rapeseed varieties.

cargo sample

A cargo sample is a composite of average samples taken as a cargo of wheat is loaded into a ship for export. Cargo samples are inspected and graded, and portions of them are sent to the Grain Research Laboratory for analysis.

caryopsis

The caryopsis is the kernel of cereal grains and grasses with the hull removed.
See *groats*.

cash crops

Cash crops are crops produced for direct sale for cash.

cash purchase ticket

A cash purchase ticket is a ticket issued indicating the grade, weight, price and amount payable to the owner of the grain for each delivery of grain to a primary elevator, process elevator or grain dealer. The ticket is a negotiable instrument and can be cashed at any chartered bank or credit union. It is defined in the Canada Grain Act.

cereal grains

Cereal grains are wheat, rye, barley, oats and triticale.

certificate

The CGC issues a number of certificates assuring grain quality. These include

- Inspection certificate, issued following an official inspection of a sample of grain
- Certificate Final, issued on cargoes of grain for export, stipulates the grade and weight of the grain
- Submitted sample certificate, issued for a submitted sample
- Western Certificate (Eastern Division)
- I-7 certificate (sample salvage)

Certificate Final

The Certificate Final is issued by the CGC for each cargo of export grain. The Certificate Final stipulates the grade and weight of the grain loaded on a vessel.

chlorophyll

Chlorophyll is the green pigment found in all green plants. It is essential for photosynthesis. In canola, seeds lose their chlorophyll as they ripen. However, canola seeds do not all ripen at once. Therefore in harvested canola, some seeds may still contain some chlorophyll.

class

Classes are defined under the Canada Grain Act. Class, in respect of grain, means any variety or varieties of grain designated by order of the CGC as a class.

commercially clean

Commercially clean shipments are shipments of grain whose dockage falls within allowed limits and is of a type normally present after standard commercial cleaning.

Commission

The Canadian Grain Commission is referred to as the CGC. The Chief Commissioner of the CGC reports directly to the Minister of Agriculture.

Commission Order

A Commission order is a directive of the CGC consistent with Section 118 of the Canada Grain Act. An order remains in effect only until the end of the crop year in which it is issued. Orders can be viewed from the CGC web site at
http://www.grainscanada.gc.ca/Regulatory/regmenu-e.htm#orders.

composite sample

A composite sample is composed of a number of distinct portions, each obtained in a prescribed manner from consecutive samples. The portions are blended to make the composite.

consecutive samples

Consecutive samples are samples taken one after another in a prescribed manner from the same lot of grain.

consigned car

A consigned car is a carlot of grain delivered on the basis of an arranged sales agreement between the owner of the grain and a marketing agency.

contaminated grain

▲ **Important:** Wear gloves and a mask to handle any sample that is suspected of containing contaminated grain.

Contaminated is defined in the *"Canada Grain Act"* as; "Contaminated means, in respect of grain, containing any substance in sufficient quantity that the grain is unfit for consumption by persons or animals or is adulterated within the meaning of the regulations made pursuant to sections B.01.046(1), B.15.001 and B.15.002(1) of the *Food and Drugs Act*."

Determination as to whether grain is contaminated will be made by the Grain Research Laboratory in consultation with the Chief Grain Inspector for Canada. Samples deemed to be contaminated are graded *"Type of Grain,* Sample Condemned.

Paragraph 76. (1) of the Canada Grain Act specifies that operators of licensed terminal or transfer elevator must inform the CGC if they find grain to be infested or contaminated, or to have gone or to be likely to go out of condition or otherwise to require treatment. The CGC may inspect the grain.

The CGC tells the operator how to treat or dispose of the grain. If the grain has been special binned, the elevator operator may recover the costs of treating or disposing of the grain from the owner of the grain.

Paragraph 90. (1) says that a CGC inspector who believes on reasonable grounds that grain is contaminated may sieze any evidence necessary to support their suspicion. Paragraph 104 says that an operator of a licensed elevator must not knowingly receive or discharge any grain, grain product or screenings that is infested or contaminated or that may reasonably be regarded as being infested or contaminated

cool and sweet

Cool and sweet are terms used to describe the condition of grain which is of a normal temperature and is free from any objectionable odour.

Cox funnel

A Cox funnel is used in determining test weight in conjunction with the 0.5-litre measure to control the flow of grain into the measure.

crop year

The crop year is from August 1 to July 31 of the following year, as defined in the Canada Grain Act. The Governor in Council may, by order, vary the period of a crop year to another period of not less than three hundred and sixty-five days.

CWB

Canadian Wheat Board.

damp

A sample of grain is identified as damp if the moisture content exceeds the tough range defined for that class of grain. In terms of moisture content, grain is classified as straight, tough, or damp. For corn, soybeans, sunflower seed and safflower seed, there are two additional classes of moisture content, moist and wet.

darkened kernels (amber durum)

Darkened kernels (amber durum) – Darkened kernels are similar in appearance to penetrated smudge with the exception that discolouration is gray to charcoal in colour rather than red to dark brown.

For grading purposes, darkened kernels should be considered as, and in conjunction with severe midge damage.

degermed kernels

Degermed kernels have had their germ removed. If the sample contains sprouted kernels, degermed kernels that are clearly not mechanically damaged are classed as sprouted. Degermed kernels are a grading factor for wheat, rye and triticale.

dehulled

Occasionally used for *hulled.*

direct hit shipments

Direct hit shipments are those shipments where Canadian grains, oilseeds and/or pulses are transferred from trucks and/or railcars directly to a vessel without added processing.

dockage

According to the Canada Grain Act, dockage is material that must be removed from grain by the use of approved cleaning equipment so that the grain can be assigned a grade. Once it has been removed from the grain, dockage is called *screenings*.

To report the percentage by weight of dockage in a sample,

For . . .	dockage is . . .
grain that is not commercially clean	reported in increments of 0.1%
eastern grains	assessed to the nearest 0.1%
export shipments authorized by the CGC to contain dockage	reported to the nearest 0.1%
grain graded *Sample Salvage, Sample Canada/CW/CE Account Fireburnt*	not reported
samples of official carlot or trucklot shipments containing dockage within established export limits for commercial cleanliness; for example, domestic buckwheat, 2.5%	what is normally present after ordinary commercial cleaning—there is no minimum canola, 2.5%, or dockage
off-grades	dockage is covered in the section describing the specific class of grain

Allowances are made for finely broken seeds in indirect export shipments.

earth pellets

Earth pellets are a type of foreign material found in grains.

Soft earth pellets include soft fertilizer pellets, except in domestic mustard seed, and any non-toxic material of a similar consistency. Earth pellets remaining in cleaned samples are handpicked and, up to specified tolerances, their percentage by weight is added to the percentage by weight of dockage in domestic shipments to terminals. Export shipments must be practically free from earth pellets.

Hard earth pellets are stones.

Eastern and western grain, mixed

Mixtures of eastern and western grain, except for corn, are graded *[class of grain] Sample Eastern and Western Mixed.* When the composition of the samples is known or can be established by analysis, it is recorded on the back of the inspection certificate.

Separate lots of western corn may be loaded to vessels without separation at the request of shippers.

Electronic Inspection System (EIS)

The Electronic Inspection System, used by inspectors to determine test weight, dockage and grading factor percentages, includes a computer, electronic scale and a printer.

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elevator

Licensed grain elevators are of four types: primary, process, transfer and terminal.

End-use certificate

End-use certificates are issued upon request for grain imported into Canada as prescribed under the Canada Grain Act.

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ergot

Ergot is a fungal disease which occurs on cereals and grasses. It is most prevalent on rye, triticale, wheat, and barley, in decreasing order of occurrence. It is rarely found on oats. The disease produces hard dense fungus bodies, called *sclerotia*, having a purplish black exterior, a purplish white to off-white interior, and a relatively smooth surface texture.

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excreta

Excreta is the grading factor term used for excrement from any animal including mammals, birds and insects.

Usually excreta are removed as dockage. Any that remains may become a grading factor.

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experimental grades

Experimental grades are established to provide the Canadian Wheat Board a way to market new varieties of wheat and barley to assess their acceptability in world markets.

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export ready

Export ready refers to carlots which meet the following criteria:

1. The lot must meet the commercially clean specifications for the grade
2. Wheat of other classes and contrasting classes must meet the export specifications for the grade
3. Total foreign material must meet the export specification for the grade.

Carlots, which are commercially clean but do not meet the export specifications for either wheat of other classes or total foreign material, will be designated as "Not Ready for Export".

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extraneous material

Can be defined as glass, metal wood, plastic or any other material not already defined in the Official Grain Grading Guide.

Note: Canadian Grain Commission personnel should refer to ISO national work instruction "*Suspect Contaminated Grain, Handling Procedures*" for specific procedures to be followed when handling samples suspected of containing extraneous materials.

fair average quality (FAQ)

FAQ is a term used in grain marketing in some countries to describe the current year's grain quality on the basis of an average sample. The FAQ is a class of grain which is said to represent the quality of a commodity produced in a given year. FAQ standards of quality may change from year to year.

falling number

The falling number is a measure of enzyme activity as a result of sprouting. It is a measure of how many seconds it takes for a plunger to sink through a paste made of ground grain and water.

The test works on the principle that the presence of alpha-amylase causes the gelatinized starch to be reduced to sugars, with a loss of viscosity. The loss in viscosity results in a lower falling number. Samples of grain with high amounts of alpha-amylase will have a falling number of around 70 seconds. Grain which is sound and has low levels of enzyme will have a high falling number, for example, 350 seconds.

fertilizer pellets

Fertilizer pellets are pellitized plant nutrients which are typically small, hard and either round and white, or irregular-shaped and pink or red. Fertilizer pellets are not considered a hazardous substance however there is no visible means of assuring that material resembling fertilizer pellets is not some other contaminant. Refer to the specific grain chapter for assessment procedures.

fireburnt kernels

Fireburnt kernels are kernels burned or scorched by fire. A cross-section of a fireburnt kernel resembles charcoal, with numerous air holes. These air holes result in a low-weight kernel which crumbles easily under pressure.

The Off-Grades of Grades of Grain and Grades of Screenings Order excludes from any Class I or Class II grade any grain having a fireburnt odour or containing fireburnt kernels in excess of established tolerances, because it is not possible to separate all kernels affected by smoke or heat from samples containing grain damaged by fire.

foreign grain

If the inspector suspects that a sample or shipment of grain is not of Canadian origin, the shipper must provide a letter indicating the country of origin, before official grading occurs.

Unofficial samples

Inspection services may be provided for samples of foreign grains. Certificates or letters must clearly indicate that the grade provided is the grade the sample would qualify for if the grain had been of Canadian origin.

Official samples, terminal receipts

Inspection records and certificates specify the class of grain and, in place of the grade, the country of origin. For example, *Corn, USA origin.*

foreign material

Foreign material is material other than grain of the same class that remains in the sample after the removal of dockage. Some examples of foreign materials found in grain samples are

- Cereal grains, sometimes called other cereal grains
- Earth pellets, soft
- Ergot
- Fertilizer pellets, hard
- Large seeds
- Matter other than cereal grains
- Roughage
- Sclerotinia
- Small oilseeds
- Small seeds
- Stones

Many of the materials, such as stones, ergot, and sclerotinia have separate tolerances. Foreign material reduces the value—there is less desired grain for the weight or volume purchased. In addition, the presence of foreign material in grain compromises our reputation for clean grain.

Even the presence of other cereal grains can compromise the quality of the predominant grain. For example, the presence of barley in wheat reduces milling yield. Oats in red spring wheat reduces milling yield and gives the flour a duller colour.

free fatty acids

Oilseed quality is determined in part by the free fatty acid test.

Free fatty acids are components that reduce the smoke point in frying fats and oxidize rapidly, giving rancid flavours.

The test gives a direct measure of the processing qualities of the oil and the amount of lye required to refine oils. Top canola seed usually has less than 0.7% free fatty acids. International specifications for top grade oil are usually set at 2.0% free fatty acids.

frost damage

The severity of frost damage depends on the stage of maturity of the grain, the temperature to which the grain is exposed, and the duration of exposure.

In wheat, as the degree of frost damage increases,

- Wheat milling becomes more difficult
- Flour yield decreases
- Flour ash content increases
- Flour colour becomes darker, which may not be commercially acceptable
- Bread volume, appearance, crumb structure and crumb colour deteriorate

frost/heat stress

Frost/Heat Stress refers to wheat kernels with blistered brans as a result of exposure to freezing temperatures or prolonged hot weather conditions. The degree of blistering ranges from fine to coarse and is dependent upon the maturity of the grain, the temperature to which the grain is exposed and the duration of the exposure. Samples containing kernels affected by frost/heat stress are graded according to the degree of soundness definition as reflected in the standard or guide samples for each grade.

fusarium head blight

Fusarium head blight is a fungal disease of wheat and other cereal crops.

In wheat it is characterized by the presence of kernels that appear lifeless, thin and shrunken. The kernels show a whitish or pinkish fibrous mould usually occurring in the crease area but sometimes found in the germ of the kernel as well. The presence of the mould on individual kernels is confirmed using a 10-power magnifier.

Fusarium may produce mycotoxins such as vomitoxin. Affected grain may be unpalatable or toxic to animals, and is considered acceptable for human consumption only when virtually free of mycotoxins.

glucosinolates

Glucosinolates are natural components of canola, rapeseed, and mustard seed. These compounds are responsible for the pungent odour and sharp flavour of cabbage, brussels sprouts, radishes, broccoli and cauliflower. They are natural toxicants, associated with goitre and liver damage when consumed in large quantities.

Glucosinolates may be desirable in mustard seed destined for condiment use. However, high levels in rapeseed restricted the use of this seed for feed. Breeding programs to reduce the level of glucosinolates in rapeseed produced canola.

grade certificate

A grade certificate attests to the quality of a commodity graded by official inspectors, testers and graders. It is another name for inspection certificate.

grade code

A grade code is a four-digit code used throughout the grain industry to identify each grade of each class of grain. See also *grain code*.

grades of grain

Grades of grain are defined by specifications in

- The Canada Grain Regulations
- The Official Grain Grading Guide

Class	Authority	Example
I	Canada Grain Regulations	*Wheat, No. 1 Canada Western Red Spring*
II (special grades)	Canada Grain Regulations	experimental grades
III (off-grades)	Off-Grades of Grain and Grades of Screenings Order	tough, damp, rejected and sample grades
IV (screenings)	Off-Grades of Grain and Grades of Screenings Order	*Screenings, No. 1 Feed*

grading factor

A grading factor is a physical condition of grain, the result of growing conditions, handling procedures or storage practices. It is a visual characteristic that indicates a reduction in quality; for example, frost damage, sprouted kernels, or heated kernels. Only relevant grading factors are shown as reasons for a grade.

- If a sample of wheat grades No. 3 for one particular reason, there is no need to list other factors that might be acceptable in a higher grade.
- If the sample is No. 3 for a combination of reasons, the combination must be shown in order of importance.

grain

A grain is any seed named in the Canada Grain Act or designated by the Canada Grain Regulations as a grain.

grain code

A grain code is a two-digit code used throughout the industry for each class of grain. See also *grade code*.

grass-green kernels

Grass-green kernels are kernels of wheat that are distinctly green because of immaturity.

grasshopper damage

See insect damage.

groats

Groats are hulled grains, and refer to the caryopsis of domestic or wild oats; that is, it is the kernel with the hull removed.

hard vitreous kernels - HVK

Vitreousness is the natural translucence that is a visible sign of kernel hardness.

Hard vitreous kernels
- Are whole or broken, reasonably sound kernels that show clear evidence of vitreousness, even though they may be bleached
- Include hard vitreous kernels of wheats of other classes that blend

Non-vitreous kernels of amber durum
- Have a starch spot of any size
- Are of other wheat classes and otherwise damaged, which means sprouted, binburnt, severely mildewed, rotted, mouldy, heated, fireburnt, showing penetrated smudge, degermed, grass green, severely midge damaged, or severely frost damaged

Non-vitreous kernels of red spring and red winter wheats
- Are starchy
- Are of contrasting wheat classes and otherwise damaged, which means sprouted, binburnt, severely mildewed, rotted, mouldy, heated, fireburnt, showing penetrated smudge, degermed, grass green, severely midge damaged, or severely frost damaged

HVK content is related to protein content and milling quality, which are particularly important in durum wheat. Non-vitreous kernels are produced under cool maturation conditions, abundant soil moisture and insufficient nitrogen. Flours milled from non-viteous wheat have reduced protein content and produce poor loaf volumes. Non-vitreous kernels are not as significant in soft wheats, since low protein is desirable for most soft wheat end-products.

hazardous substance

A hazardous substance is defined in the Regulations as any pesticide, herbicide or desiccant.

heated kernels

Heated kernels have the light tan to dark brown colour or an odour typical of grain that has heated in storage. The term includes kernels discoloured from artificial drying, but not binburnt or fireburnt kernels.

hulled

Hulled kernels have the hulls removed, e.g., oat groats, peeled barley and hulled sunflower seeds.

hulless

Hulless kernels have naturally loose hulls or no hulls, e.g., wheat, hulless oats and barley.

identity-preserved

In a primary elevator, identity-preserved or special bin grain is held in a separate bin at the request of the owner.

immature

Immature damaged soybeans are characterized by a green exterior appearance in conjunction with any green discolouration of the cotyledon. Examination of the cotyledons is determined by cutting the soybeans in cross section. For grading purposes, immature damaged soybeans are considered as part of the "Total Damage" grade specification.

Soybeans that are green in appearance and have no discolouration of the cotyledon are to be assessed against the overall colour of the sample.

indirect shipment

An indirect shipment from a terminal elevator is one that will be reloaded at a transfer elevator for delivery to the buyer.

Industry Services Automation

Industry Services Automation (ISA) is a networked computerized system that is incorporated into the visual grading system used by the CGC's Inspection Services for the analysis of dockage and grading factors, test weight, and moisture content. The workstation consists of a computer terminal, keyboard, and Mettler electronic scale. The output from the ISA represents the original and official Inspection Report.

insect damage

For CWRS, CWHWS and CWAD, there are specific limits for kernels damaged by grasshopper and armyworm, midge and sawfly.

Grasshopper and armyworm damage

Grasshoppers and armyworms chew out sections of kernels, particularly the ends and sides. At an early stage, armyworms may chew tunnels through the kernels. This destroys the endosperm, and leaves the exposed chewed areas susceptible to fungal and bacterial infections. Heavy discolourations and moulds may result.

Orange wheat blossom midge

The orange wheat blossom midge causes a distinct form of damage. Grade tolerances for midge have existed for many years based primarily on the shrivelling and distortion of midge-damaged kernels. The tiny midge larvae feed directly on the developing kernels in the heads of wheat. The extent of damage largely depends on the number of larvae feeding on each kernel.

Only recently have the full effects of midge damage on Canadian red spring bread wheat quality been studied, revealing the seriousness of midge damage to quality. The shrunken distorted grains reduce flour yields and produce dark flours with increased flour ash. Severely midge-damaged wheat exhibits weak, sticky dough properties, low baking absorption and poor bread quality. Protein content is abnormally high, but gluten protein quality is distinctly inferior.

insect infestation

The Canada Grain Regulations establish procedures for handling infested grain at primary elevators. Grain found infested at terminal or transfer elevators is handled and treated under the direction of an officer of the CGC.

According to the Canada Grain Act, infested grain is grain that contains any injurious, noxious or troublesome insect or animal pest.

insect parts

Insect parts refers to pieces of insects such as grasshoppers and lady bugs that remain in the sample after cleaning or processing. Samples are analyzed for the percentage of insect fragments and graded according to established tolerances.

If pulse crops come into contact with insects during the harvesting process, it may result in seed staining and earth adhering to the seed and may result in samples having an objectionable odour. Samples containing staining of this nature will be considered to be earth tagged and graded according to colour definitions. Samples having a distinct objectionable odour not associated with the quality of the grain will be graded *Type of Grain* Sample Account Odour.

inspection certificate

A CGC grain inspector issues an inspection certificate following an official inspection of a sample of grain. The certificate must state

- Where the grain was grown in Canada
- The grade according to the Canada Grain Act
- Dockage
- Other relevant information

invisible losses

Invisible losses are normal losses of weight of grain during normal handling. Shrinkage allowances are provided to prevent gross weight losses from affecting the net weight of an elevator's grain stocks.

Invisible weight losses are primarily from

- Dust losses during handling
- Moisture losses during storage
- Unexplained weight losses in oilseeds during storage

iodine value

Iodine value is a measure of the total amount of unsaturated fatty acids in an oil. In flaxseed, iodine values of 189 or greater are required for the manufacture of paints and inks. Lower values, around 182, are needed for the manufacture of linoleum.

K

The letter K in grade tables refers to the number of kernels or kernel-sized pieces of a particular grading factor in a 500-gram sample.

laker

A laker is a long, shallow draft ship designed to transport cargoes within the inland water system of the St. Lawrence Seaway.

large seeds

Large seeds are considered foreign material in some classes of grain. Large seeds include domestic and wild seeds that remain on top of the No. 4.5 round-hole sieve.

load lines

Load lines are the centimeter graduations by which the level of grain in a railcar is measured.

manufactured products

Manufactured products are materials other than grain cleanings and includes materials such as malted, crushed, or ground grain which cannot be assigned a grade. Inspection may be performed on request. Certificates issued have only the composition endorsed on the back, providing the identification of the components is unquestionable; for example, *80% crushed wheat, 15% crushed barley, 5% whole wheat.* On the face of the certificate, *Manufactured product* is indicated.

marine leg

A marine leg is a mechanical device used to offload bulk grain from the hold of a vessel, normally from a laker into a transfer elevator.

matter other than cereal grains

Matter other than cereal grains is a type of foreign material. It includes large seeds and seeds of such grains as buckwheat, peas, corn and beans, and may include coarse vegetable matter.

midge damage

Midge damage is found mostly in wheat, although it has been detected in barley, rye, and some grasses.

The only part of the plant damaged is the developing seed. When a kernel of grain is attacked either it will not develop or it will develop as a shrivelled, deformed kernel. Infestations of the wheat midge can significantly reduce yield. They are most severe when rainfall is high during the spring or summer.

See *insect damage*.

mildew

Mildew is a fungal condition that affects wheat, barley and a number of other grains. It develops in unthreshed kernels of grain, usually under conditions of excessive moisture. It should not be confused with the disease powdery mildew, which attacks the leaves, reducing yield.

Downy mildew, caused by *Peronospora manshurica*, can sometimes form a white coating on soybeans. These are spores of the fungus. They do not affect the processing or safety of the seed, but can affect the appearance.

mineral matter

Mineral matter refers to stones, earth pellets, and fertilizer pellets that may be found in samples of grain.

moist

A sample of grain is identified as moist if the moisture content exceeds the *damp* range established for that class of grain.

moisture content

Moisture content is a measure of the water content of grain.

Grain that is within acceptable limits of moisture is referred to as a straight grade. With increasing moisture content, grain may be referred to as *tough, damp, moist* and *wet*. See Chapter 2, *Moisture testing*.

mudball bean

Mudball beans are beans or soybeans completely covered with caked-on mud.

mycotoxins

Mycotoxins are poisonous substances produced by some species of fungi.

For example, several Fusarium species can cause a disease called fusarium head blight. One of the more important species of fusarium, *Fusarium graminearum*, can produce several mycotoxins, most commonly, deoxynivalenol or vomitoxin, which, when present in feed grain, is distasteful and can reduce the rate of weight gain in some animals.

In corn, *Fusarium graminearum*, also called *Gibbarella zeae*, causes the disease gibberella ear rot. Besides deoxynivalenol, another compound known as zearalerone may be formed. This compound has estrogen-like effects, especially in pigs and cattle.

non-Board grain

Non-Board grain is grain marketed through the open market system. Such grain includes domestic feed wheat and barley, rye, oilseeds and specialty crops.

non-vitreous

See hard vitreous kernels (HVK).

not commercially clean

Shipments of grain whose dockage content falls outside of allowed limits.
See *commercially clean*.

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objectionable odour

An objectionable odour is one not normally associated with grain, such as skunk, sour, musty, oil, or gas. Heated or fireburnt odours are identified specifically and not included in the general category of objectionable odour.

Off-Grades of Grain and Grades of Screenings Order

The Off-Grades of Grain and Grades of Screening Order is issued by the CGC. It provides the authority for the application of the grading terms rejected, sample, tough,damp, moist, and wet, and defines grades of screenings.

The Off-Grades of Grain and Screenings Order is available through the CGC web site at www.cgc.ca. The direct address is
http://www.grainscanada.gc.ca/Regulatory/regmenu-e.htm#orders

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official carlot unload sample

An official carlot unload sample is a sample taken by a CGC grain inspector or by any sampling device authorized by the CGC as a railcar is unloaded at a terminal elevator.

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official grading

An official grading is one conducted by an inspector of the CGC on an unofficial sample.

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official inspection

An official inspection is done when an official sample of grain is graded by a CGC inspector.

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official sample

An official sample of grain is drawn under the direct control or continuous supervision of an authorized employee of the CGC.

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official weighing

An official weighing is done on approved equipment under the supervision authorized by the CGC or in a manner authorized by the CGC.

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oilseeds

Oilseeds include flaxseed and solin, canola and rapeseed, soybeans, safflower and sunflower seed.

optional analysis

Where a shipper requests special cleaning of a carlot of grain at a terminal or transfer elevator, and the elevator manager agrees, dockage material will be analysed for the presence of grain. The percentage and grade of any grain contained in the dockage will be reported and elevator stocks will be adjusted on the basis of the analysis. Agreement between the shipper and unload elevator must be conveyed to the CGC in writing prior to the analysis being performed.

Order of Precedence

The following list is used to assign reasons for *Sample* grades.

1. Sample Account Admixture, Contaminated grain
2. Sample Salvage
3. Sample Account Fireburnt
4. Sample Account Excreta
5. Sample Account Fusarium
6. Sample Account Ergot
7. Sample Account Odour
8. Sample Account Rotted
9. Sample Account Heated
10. Sample Account Mildewed
11. Sample Account Damaged
12. Sample Account Damage and Foreign Material
13. Sample Account Dehulled
14. Sample Account Stained Kernels
15. Sample Account Sprouted
16. Sample Account Admixture
17. Sample Account Splits
18. Sample Account Lightweight
19. Sample Account Stones
20. Sample Account Mixed Colours

other cereal grains

A cereal grain mixed into another type of cereal grain is considered foreign material. The presence of other cereal grains affects the processing quality of the main grain.

In . . .	other cereal grains are . . .
wheat	rye, barley, oats, triticale
rye	wheat, barley, oats, triticale
barley	wheat, rye, oats, triticale
oats	wheat, rye, barley, triticale
triticale	wheat, rye, barley, oats

other matter

Other matter refers to inseparable material excluding cereal grains, large seeds, wild oats, stones, mineral matter, ergot and sclerotinia.

out of condition

Grain which is out of condition has deterioriated in storage. Grain that is damp, heating or spoiling in storage requires special treatment such as drying or aeration to preserve its quality or to prevent further deterioration.

Paragraph 76. (1) of the Canada Grain Act specifies that operators of licensed terminal or transfer elevator must inform the CGC if they find grain that is or is likely to go out of condition. The CGC may inspect the grain. The CGC tells the operator how to treat or dispose of the grain. If the grain has been special binned, the elevator operator may recover the costs of treating or disposing of the grain from the owner of the grain.

pass-on slip

A pass-on slip is a document given to the captain or mate of a vessel by the CGC inspector when grain is loaded into the vessel from a terminal elevator.
The information on the slip includes the vessel name, exact storage of all grades of grain loaded, a diagram of the stowage plan, the date, and the loading terminal. This slip is collected by the inspector in charge of the next loading elevator.

pink kernels

Pink pigment in wheat kernels is an indication of immaturity.

primary elevator

A primary elevator is a licensed elevator used to accept deliveries of grain directly from producers for storage or forwarding.

process elevator

A process elevator is an elevator which is used principally to receive and store grain for processing directly into other products.

processed sample

A processed sample is a sample of grain that appears to have been cleaned at seed cleaning plants before being delivered to terminal or transfer elevators.
See *unprocessed sample*.

producer car

A producer car is a railcar that is loaded and shipped by a producer to a terminal elevator. Producers apply to the CGC to have a railcar allocated to them.

pulses

Pulses are crops grown for their edible seeds, such as peas, lentils, chick peas or beans.

reference variety

A reference variety of a grain is a variety currently listed as registered in Canada by AAFC.

registered variety

A registered variety is a variety of grain registered under the authority of the Canada Seeds Act and listed on the Variety Order List.

Regulations

Canada Grain Regulations. The Regulations can be viewed through the CGC web site at www.grainscanada.gc.ca

The direct address is
http://www.grainscanada.gc.ca/Regulatory/Regulations/regs1-e.htm.

rejected grades

Rejected grades are defined in the Off-Grades of Grain and Grades of Screenings Order. The term is not used in grading eastern grain. Numerical grades of western grain may be graded rejected only because of stones. If the stones are removed, the Rejected designation is dropped.

representative portion

The terms "Minimum", "Optimum" and "Export" refer to the minimum sample portion to be analyzed when a factor is present in varying concentrations.

Mimimum–The minimum portions allow inspectors to exercise judgment regarding sample sizes to be analyzed. This would be appropriate when reporting concentrations of factors that would not determine grade. However, minimum sample portions may also be used when the factor present has determined the grade, if the concentration is well within tolerance levels for that grade. Minimum portions may be used when the grade would not be altered by analysis of a larger sample.

Optimum–The optimum sample portion should be analyzed for those factors that would determine the grade when concentrations appear to be within the range of statutory grade specifications, if it appears that the concentration could result in downgrading of the grain. If the concentration of a factor is only marginally in excess or less than a tolerance, the inspector should exercise judgment and pick a larger sample portion.

Export–The export portions are the minimum sample portions to be picked for specific factors when analyzing export samples. These standards do not prevent the inspector from analyzing larger portions when appropriate.

representative sample

Grades are based on samples. To ensure samples adequately reflect the entire lot of grain, proper sampling procedures must be used. Official samples are taken using continuous sampling devices. The CGC publishes a factsheet on sampling procedures, called *Taking a Representative Sample*.

retention time

See *storage of samples*.

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rotted

Rotted kernels are decomposed or decayed because of bacteria or fungi. Rot is usually indicated by blackening, discolouration and softening of all or part of the kernel.

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roughage

Roughage is a type of foreign material found in grains. It includes chaff, loose hulls, empty seed pods, knuckles, etc., that are readily removable by aspiration, handpicking, or other cleaning procedures.

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running sample

A running sample is a sample obtained while grain is being conveyed on a belt or as it flows from a spout.

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saltie

A saltie is a vessel designed for ocean navigation.

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sample

A sample is a portion of grain taken to represent an entire truckload, carload or cargo.

The size of a sample to be analysed for the presence of specific grading factors is established for each class of grain in its section. The term approximate is often used, allowing inspectors to take into consideration the concentration of the grading factor in the sample.

Types of samples include

- average sample
- cargo sample
- composite sample
- consecutive sample
- official carlot unload sample
- official sample
- processed sample
- running sample
- standard sample
- submitted sample
- unprocessed sample

Sample eastern and western mixed

See *Eastern and Western Grain, Mixed*.

sample grades

Sample grades are defined in the Off-Grades of Grain and Grades of Screenings Order. Grain that is not eligible for Class I or II grades under the Canada Grain Act is graded *Sample*. With the exception of sample salvage, reference is made in all sample grades to Canada (CAN), Canada Western (CW) or Canada Eastern (CE); for example, *Barley, Sample CW Account Heated.*

Only the major grading factor forms part of the grade name. Secondary reasons for a sample grade are noted in remarks; for example, a sample of rye having a strong chemical odour and containing 9.0% by weight of heated kernels might have the following comments:

- The grade *is Rye, Sample CW/CE, Account Odour.*
- The inspector's remarks on form I-12 are *strong chemical odour, 9.0% heated.*

The remarks section of the inspection record for samples graded *Sample CW/CE/Canada* may include the following:

- For wheat, the class or classes of wheat eligible for sample grades
- The nature and concentration of admixture in samples graded Sample *CW/CE/Canad, Account Admixture*
- The kind of odour in samples graded *Sample CW/CE/Canada, Account Odour*

When sample grades are assigned, the reason shown for the grade is selected according to the Order of Precedence.

sample interval

A sample interval is the time between the repeated sample-capturing action of a sample method or device.

sample retention time

Sample retention times are outlined in specific Inspection procedures located online at K:\Isqms\03 – Procedure Manual\Procedures (English – French).

sample salvage

Any grain salvaged from a wreck in transit containing over 2.5% by weight of stones or any other conspicuous ground material, removable or not, is graded *[class of grain], Sample Salvage.* For example, *Wheat, Sample Salvage*.

- Admixtures of inseparable seeds or other grains are disregarded if they do not exceed the tolerances permitted in the lowest grade of that grain.
- The composition of official samples is entered on inspection records and endorsed on the back of certificates.
- The composition of unofficial samples is shown on the face of form I-7 certificates and the I-12 form.

sample size to be analysed

The size of a sample to be analysed for the presence of specific grading factors is established for each class of grain in its section of this guide.

sawfly damage

The wheat stem sawfly has caused serious harvest losses to spring wheat in the prairie region. It attacks the base of stems causing tillers of mature plants to break off. Early swathing can reduce spring wheat harvest losses, but the most effective means of managing this insect pest has been the production of resistant cultivars.

See *insect damage*.

scab damage

Scab damage refers to kernels of wheat that have been severely affected by fusarium. Scab damage is included in and assessed as fusarium damage for grade assessment. The percentage concentration of scab damage may be recorded for specific markets upon request.

- Scab kernels must be completely dull, lifeless, with a chalky appearance, and
- Must have no semblance of soundness and no visible natural wheat colour, and
- Scab kernels must have a white or pinkish fibrous growth

Note: If there is any natural wheat colour, the kernel is not to be considered as scab damage

scalp

Scalping refers to the removal of roughage material in a sieving process.

sclerotia

Sclerotia are hard, compact masses of fungal mycelium that serve as resting or survival structures.

One type of sclerotia is the mass of fungal tissue produced by the soil-borne fungus *Sclerotinia sclerotiorum*, which attacks crops such as sunflower and canola. Infections result in yield loss. While it does not attack cereal crops, sclerotia may be found as contaminants in samples of cereal grains from infected fields.

screenings

Screenings is dockage material that has been removed by cleaning from a parcel of grain. Screenings qualify for Class IV grades. See *Off-Grades of Grain and Grades of Screenings Order*.

severely damaged

Kernels are considered to be severely damaged when

- the kernel is severely shriveled or distorted due to weather, insect, fungal and/or other reason
- in wheat, the cheeks and/or back of the kernel are ruptured

shipment order slip

The shipment order slip is given by the terminal elevator operator to the inspector in charge. It indicates the quantity and grade of grain ordered for shipment.

shrinkage allowances

A shrinkage allowance is deducted from the gross weight of grain delivered, to adjust for the normal loss of weight, sometimes called invisible losses, during handling of grain.

shrunken kernels

Shrunken kernels in wheat are whole kernels that pass through a No. 4.5 slotted sieve.

See *Thin and shrunken*.

sieves

Sieves used in dockage assessment and grading procedures are listed in the Canada Grain Regulations. The accuracy of sieves used by the CGC is regularly monitored. See Chapter 3 of this guide, *Specifications for sieves*.

small oilseeds

Small oilseeds include flaxseed, canola and domestic mustard seed.

small seeds

Small seeds are considered foreign material in some classes of grain. It includes all seeds removable through a No. 4.5 round-hole sieve.

smudge

Smudge refers to dark discolourations caused by fungal or bacterial infection. The discolouration may be brown, black, or reddish. It occurs mainly in wheat and barley.

According to the Regulations, smudge is more severe than blackpoint.

If discolouration occurs on . . .	Then the kernel is considered . . .
more than one-half of the surface, or infection extends into the crease	smudge-damaged
less than one-half of the bran surface, no discolouration in the crease	blackpoint-damaged

Penetrated smudge

Penetrated smudge is characterized by discolouration penetrating and extending throughout the endosperm, usually as a result of a serious infection of a fungus such as the various species of *Alternaria*.

Superficial discolouration

Superficial discolouration is a reddish discolouration not penetrating the endosperm. This factor will be evaluated subjectively in relation to the degree of soundness without reference to specific tolerances.

Red smudge

Red smudge is a dark reddish discolouration usually associated with durum wheat. It usually affects the entire bran portion of the kernel. Discolouration is not superficial and cannot be removed through abrasion. Red smudge is caused by infections of the fungus *Pyrenophora tritici-repentis*, which also causes the leaf disease tan spot.

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smut

See *bunt.*

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soundness

Soundness refers to overall visual grain quality. Sound grain is reasonably well matured and reasonably free from kernels damaged by frost, mildew, bleaching, or weather.

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special bin grain

In a primary elevator, special bin grain is held in a separate bin at the request of the owner. It is sometimes referred to as identity-preserved.

In a terminal elevator, special bin grain is held by authority of the CGC in bins registered by bin numbers in the owner's name.

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special cleaning

Special cleaning refers to any cleaning of grain in addition to the usual dockage assessment procedures. Special cleaning is used to improve the grade of the grain.

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special crops

Special crops are considered to be beans, buckwheat, chick peas, corn, fababeans, lentils, mustard, peas, safflower, soybeans, sunflower, and triticale.

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spiral cleaner

The spiral cleaner removes flat seeds from yellow mustard seed.

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sprouted

Kernels are classed as sprouted when any of the following conditions exist:

- Growth is evident in the germ area.
- Bran is noticeably split over the germ.
- The germ is removed and there is discolouration normally attributable to sprouting.
- The germ, though intact, is distinctly swollen because of growth.

Severely sprouted

Kernels are considered severely sprouted when

- Sprouts extend beyond the normal contours of the germ
- Kernels are severely degenerated as an apparent result of advanced sprouting

stained kernels

Staining can be artificial or natural.

Artificial stain

- Includes any stain on kernels caused by contact with foreign substances such as dye or adhered foreign material such as oil, grease, paint or soot
- Does not include any stain caused by poisonous substances

Natural stain

Natural stain is any stain on kernels caused by contact with natural substances such as smut spores, soil, or weeds.

Consideration is given to the incidence of affected kernels and the nature and severity of the stain.

The nature of the adhered material is indicated on inspection records.

When the nature of the material is in doubt, the sample is sent to the Chief Grain Inspector for review, and, if necessary, for laboratory analysis.

See *weed stain.*

standard samples

The Eastern and Western Standards Committees meet annually and recommend to the CGC primary and export standard samples of grain for use in grading during that crop year.

Primary standard samples

Primary standard samples are prepared for most grades of grain and represent as nearly as possible the minimum quality of each grade, considering the predominant grading factors in the current crop. They are used as visual guides to grading grain before and on delivery at terminal elevators, and on shipments from terminal elevators when no export standard sample is established for a grade.

Export standard samples

Export standard samples are created only for Canada Western grains. They are prepared for most grades of wheat and general purpose grades of barley and govern grading of shipments out of terminal, transfer, and process elevators. They are intended to ensure that the buyer receives grain that is reasonably close in quality to the average of the grade.

Minimum test weights, maximum limits of admixtures and grading factors in general are demonstrated in the export standard samples. However, overall quality is always considered. An export shipment may be assigned a certain grade although the shipment is slightly below the requirements in one factor, provided that in the judgment of the inspector it is sufficiently superior in other factors to be equal in overall quality to the export standard sample. Final decisions on the grade of such shipments are made only by senior officials of CGC's Inspection Services.

stones

Stones are hard shale, coal, hard earth pellets, and any other non toxic materials of similar consistency. Fertilizer pellets are assessed as stones, except in Domestic mustard Seed, when constituting 1.0% or less of the net sample weight. (See *Fertilizer pellets* for specific procedures to be followed when samples contain fertilizer pellets.)

Stones are considered foreign material in grain samples.

Stones removed are classified as dockage if they are readily removable by ordinary cleaning methods or by special cleaning procedures.

stowage

Stowage refers to the location or hold where grain has been loaded to a vessel.

straight

Straight grades of grain are those within accepted limits of moisture. With increasing moisture content, grain is graded *tough, damp,* moist, or *wet*.

submitted sample

A submitted sample is an unofficial sample sent in by a grain company or producer for grading or for other tests. The CGC charges a fee for any analysis on a submitted sample.

terminal elevator

A terminal elevator is a licensed elevator used principally to receive grain and condition grain for export.

An inland terminal elevator is an elevator—licensed as a primary elevator —for receiving and conditioning of the grain for direct or indirect export.

test weight

Test weight is the weight of a measured volume of grain expressed in kilograms per hectolitre. For procedures, see Chapter 1 of this guide, *Determining test weight*.

thin and shrunken

Hot dry conditions during maturation of wheat can severely reduce kernel size and cause shrunken kernels. As a result

- Test weight is reduced
- Flour yield is reduced
- More small kernels are removed during cleaning

tombstone kernels

Tombstone kernel is an obsolete term for a fusarium-damaged kernel.

tough

Grain is identified as tough if the moisture content exceeds the *straight* range established for that class of grain but is not *damp*.

transfer elevator

A transfer elevator normally

- Receives grain that has been officially graded and weighed at a terminal elevator
- Stores that grain before it is loaded to vessels for export

treated seed and other chemical substances

Treated seed

Treated seed is grain that has been coated with an agricultural chemical for agronomic purposes. These include protection of the germinating seed from insects and pathogens, and increasing the availability of nutrients to the seed when planted. Seed treatment dressings may contain one or more insecticides or fungicides, and seed inoculants usually contain either a fungus or bacteria. Both types of seed dressings contain a dye to render the treated seed visually conspicuous. The colour of the dye varies depending upon the type of treatment and the type of grain. The current Canadian colour standards for pesticide seed treatments are: cereals- pink or red, canola - baby blue or green.

Seed treated with an inoculant may have a green stain. The coatings or stains may appear greasy or powdery and surface area distribution ranges from tiny flecks to complete coverage.

Other chemical substances

Other chemical substances refers to any chemical residues either adhering to the kernel or remaining in the sample and to samples having a chemical odour of any kind.

trier

A trier is a hollow cone-shaped device used to obtain samples manually from bagged grain.

unofficial sample

An unofficial sample is a sample drawn without the supervision of an authorized employee of the CGC.

unprocessed sample

Unprocessed samples of grain are those which have not been cleaned commercially.

See also *processed sample*.

unregistered variety

Unregistered variety is sometimes used for the term non-registered variety.

See *registered variety*.

Variety Order List

The Variety Order List lists the varieties of seeds that have been registered for production in Canada under the authority of the Canada Seeds Act. Section 28 of the Canada Grain Act authorizes the grading of varieties not included under the Order into the lowest grade established by regulation for that kind of grain.

vomitoxin

Vomitoxin or deoxynivalenol is a mycotoxin produced by *Fusarium graminearum*.

Western Certificate (Eastern Division)

The Western Certificate (Eastern Division) is an export certificate issued in eastern Canada for corn loaded to a laker. It includes a statement of agreement between the shipper and purchaser indicating further inspection is not required.

1. The shipper originates the request for this type of certification before shipment.
2. The Western Certificate is issued to indicate quality at initial loading.
3. Any subsequent handling that increases breakage and lowers the grade becomes the responsibility of the buyer rather than the seller.

weed stain

A weed stain is a type of natural stain. A weed stain refers to

- The blotched or stained appearance of kernels caused by contact with the sap from green foliage of such weeds as Russian thistle
- Kernels with adhered foliage of weeds

wet

A sample of grain is identified as wet if the moisture content exceeds the moist range established for that class of grain. With increasing moisture content, grain is graded *straight, tough, damp, moist,* or *wet.*

wheat classes

The following wheat classes are produced in Canada and are graded according to specifications detailed in the Guide.

Canada Western/Eastern Amber Durum (CWAD) (CEAD)
Canada Western Red Spring (CWRS)
Canada Western Hard White Spring (CWHWS)
Canada Western Red Winter (CWRW)
Canada Prairie Spring Red (CPSR)
Canada Prairie Spring White (CPSW)
Canada Western Extra Strong (CWES)
Canada Western/Eastern Soft White Spring (CWSWS) (CESWS)
Canada Easter White Winter (CEWW)
Canada Eastern Red (CER)
Canada Eastern Red Spring (CERS)
Canada Eastern Hard Red Winter (CEHRW)
Canada Eastern Soft Red Winter (CESRW)

wheats of other classes

Other classes of wheat are all classes of wheat including non-registered varieties, other than the predominant class in the sample. Contrasting classes are classes of a different coloured wheat; for example CWAD is a contrasting class in CWRS.

wild oats

Wild oats is an annual grassy weed. It reduces crop yield, increases dockage and cleaning costs, lowers the grade, and is costly to control. Seeds of wild oats vary in colour from white to black. They are normally more slender than domestic oats and have a slanting, circular, depressed scar—sometimes called a sucker mouth—at their base, and a bent twisted awn.

working sample

A working sample of grain is usually around 1000 grams. It may be more or less, at the discretion of the inspector.

www.grainscanada.gc.ca

The World Wide Web address for the Canadian Grain Commission.